

## AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

"Fruit Tree and Grape Vine Pruning," by Geo. Quinn (Horticultural Instructor); price, 2s. 6d.; posted, 2s. 8d.

"Vinegrowers' Manual," by A. Sutherland; price, 6d.; posted, 7d.

**Journal of the Department of Agriculture**, 1s. per annum in advance; 3d. per single copy to residents of South Australia. Other places, 2s. 6d. per annum.

Any of the following bulletins and leaflets may be obtained by sending a penny stamp for postage:—

Subject.	Bulletin No.	Subject.	Bulletin No.
<b>STOCK AND DAIRYING—</b>		<b>AGRICULTURE, &amp;c.—</b>	
Bloodworms .....	I.	Agricultural Seeds, Depth of Sowing .....	71
Castration of Colts .....	XXIX.	Dry Farming Conference, 1911, Report .....	XIII.
Cocky Chaff and Straw as Feed for Stock .....	III.	Ensilage, Conservation of Green Fodder as .....	XIV.
Cow, Some Common Troubles of .....	XXXV.	Forage Crops in S.E. ....	92
Dairy Cattle, Suggested Rations for Diseases of Farm Animals .....	75	Inman Valley: Address by Director of Agriculture .....	96
Farm Flock, The .....	106	Lucerne Leaf Spot Disease .....	XV.
Farm Horses, Suggested Rations for Farm Livestock: How to Lay Foundation for Good Strains .....	VI.	Phosphatic Manures .....	87
Farm Livestock: Equivalent of Foodstuff and Feeding Rations ..	VII.	Possibility of Improvement in the Farming Practices of Hundreds of Ayers and Hanson .....	95
Horse, The .....	94	Roseworthy College Harvest—1910 .....	63
Local Pig Industry, The .....	105	1911-12 .....	69
Medicine Shelf .....	85	1912-13 .....	78
Roseworthy Agricultural College Flock in 1907-8 .....	41	1913-14 .....	83
Sheep Tick and Sheep Louse .....	84	1914-15 .....	90
Spaying of Cows .....	IV.	1915-16 .....	104
		1916-17 .....	114
<b>POULTRY—</b>		Roseworthy Agricultural College Permanent Experimental Field—1905-14 .....	89
Chickens, Ducklings, &c.: Feeding and Rearing .....	IX.	1909-10-11 .....	65
Great Importance of Drinking Water for Laying Hens .....	113	1904-15 .....	112
Incubation .....	X.	Wheaten Hay—Investigations into handling, digestibility .....	82
Poultry Tick .....	74	Rotation of Crops .....	100
Storing and Packing Eggs .....	XXVII.	Salts Injurious to Vegetation ..	103
		Seeds Imported from Abroad into South Australia .....	109
<b>HORTICULTURE, &amp;c.—</b>		Wheat Diseases and their Treatment ..	110
Codlin Moth, The .....	67	Wheat Yields Past and Future, with a reference to the principal factors that govern them .....	108
Currant Industry .....	68	Wheaten Hay, Stage to Cut .....	73
Evaporation of Apples .....	101		
Flowering Periods of Stone Fruits ..	88	<b>MISCELLANEOUS—</b>	
Fruit Drying: For Beginners .....	31	Amount of Spirit that may be Extracted from a Ton of Raisins ..	50
Fruit Flies .....	24	Beekeeping Notes—Foul Brood, &c. ....	XIII.
"Maggot Fly Pest" .....	25		
Orange in South Australia, The ..	107		
Peach-Curl Leaf Fungus .....	64		
Select List of Fruit Trees .....	91		

**THE AGRICULTURAL BUREAU.**—Particulars of this Organisation, of which every farmer should be a member, can be had on application to the Department.

# THE JOURNAL

OF THE

## Department of Agriculture

### OF SOUTH AUSTRALIA.

No. 8.

MARCH, 1918.

VOL. XXI.

*Published Monthly by the Department of Agriculture.*

Edited by H. J. FINNIS.

CONTENTS.	PAGE.
POINTS FOR PRODUCERS .. .. .	618-619
INQUIRY DEPARTMENT .. .. .	620-622
ROSEWORTHY AGRICULTURAL COLLEGE—HARVEST REPORT, 1917-1918 ..	623-634
EXPERIMENTAL FARM HARVEST REPORTS .. .. .	635-643
CO-OPERATION IN MARKETING FRUIT .. .. .	644-645
THE AGRICULTURAL BUREAU—CONFERENCES DURING 1918 .. .. .	646
WEEDS AND SEEDS .. .. .	646-647
POULTRY .. .. .	648-649
ADVISORY BOARD OF AGRICULTURE .. .. .	650-652
DAIRY AND FARM PRODUCE MARKETS .. .. .	653
THE AGRICULTURAL OUTLOOK .. .. .	654
RAINFALL .. .. .	656 657
AGRICULTURAL BUREAU REPORTS .. .. .	658

All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide"

**Notice re Copyright.**—The Copyright in all articles in this Journal is vested in the Crown, and any person reproducing or republishing the said articles without permission from the Hon. Minister of Agriculture will be liable to be proceeded against.

R. P. BLUNDELL,

*Minister of Agriculture.*

## POINTS FOR PRODUCERS.

### Livestock on the Government Farms.

Particular attention is being paid to livestock on all the State experimental farms. The Director of Agriculture (Professor Arthur J. Perkins) has intimated that it is proposed that on each farm separate types or breeds will be carried, and it is hoped that they may prove of use to local farmers. At Booborowie the Department is building up a herd of Guernsey cattle, a flock of Romney Marsh sheep, and a herd of Berkshire pigs. At Turretfield a herd of Jersey cattle, a flock of Border Leicester sheep, and a herd of Middle York pigs are being established. Ayrshire cattle, English Leicester sheep, and Middle York pigs are receiving attention at Kybybolite, and later it is proposed to add to these a herd of Tamworth pigs. Conditions are not as yet favorable to livestock on mallee farms, but it is intended, ultimately, to carry at Eyre's Peninsula and Veitch Merino or long wool Crossbred sheep.

### Cold Sweat.

Patches of cold sweat on a horse after working are always an indication that the blood circulation in the neighborhood of the patch is failing. They are a good external indication of mischief within. The best way of restoring tone to the blood vessels, says the Veterinary Lecturer, is to rub the spot vigorously till warm and dry. A warm stimulant as a drench is of use in extreme weariness—spirit, beer, coffee, milk. A handful or two of oatmeal in the drinking water is a great stay to a tired horse, and will prevent cold sweat breaking out.

### The Hoof Horn is Alive.

The hoof horn of the horse is alive. It grows—wall, sole, and frog—and yet to save a shilling or two we leave a set of shoes on for months, and cramp and deform living horn, and, clever that we are, cripple the horse and depreciate his value by pounds—such is economy. The wall grows at least half an inch a month, down and outwards (says the Veterinary Lecturer). The shoe does not grow at all, and this is left nailed on to that for months together. Take the horse to the smith every four weeks. He may not do anything, or he may. As a tradesman, he knows his business. Take his advice; if he says remove, then remove—do not try to teach him his trade.

### Treatment of Canker of the Foot.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) recommends the following treatment for cases of canker of the foot:—Remove shoes so as to get as much pressure on the diseased frogs as possible. Cut away diseased tissue ruthlessly. Poultice for three days with bran and linseed meal, renewing poultice daily. Dress with a few drops of beechwood creosote for next three days.

taking care that it does not run on to heels; poultice for three days; creosote for three days; poultice three days. Burn equal parts of blue-stone and alum in a tin in the oven until turned to a fine powder. When cool, add equal weight of calomel. Dress all diseased parts with this once daily, following with dressing of pine tar. As the horse will be fit for work on the land during this part of the treatment it is best applied at night. New soft growths will appear, and the poulticing and creosote treatment above must be renewed. It is probable that treatment will have to be carried out for a year or more before the disease is subdued. For the first three months of treatment a tablespoon of Fowler's solution of arsenic must be given morning and evening in the food for a fortnight, stopped for a fortnight and repeated. It is useless for an amateur to attempt a cure unless he is prepared to go to a large amount of trouble, and has the advice of a qualified veterinary surgeon during the course of treatment.

#### Berseem at Roseworthy.

An average annual return of 30 tons 5cwts. 9lbs. per acre has been the result achieved at the Roseworthy Agricultural College with berseem, and the College experience is that this crop is without a rival as a producer of nutritious green feed during the winter and spring. In order to obtain maximum results with this crop, the observance of the following rules is regarded as absolutely essential:—(1) The land must receive a dressing of 12 tons to 14 tons of farmyard manure per acre. (2) This must be spread and ploughed under not later than the middle of March; depth of furrow, 5in. to 6in. (3) Ploughed face to be rolled to a fine tilth and 2cwts. 36/38 grade superphosphate drilled in. (4) Surface rolled again, and 30lbs. seed per acre broadcasted and pressed in with another turn of the roller. (5) Seeding to take place between March 15th and April 15th. The later the sowing the slower and less certain the germination. (6) Immediately after seeding give the seed bed a thorough irrigation.

#### LIME AS A SOIL DRESSING.

In most parts of the wheat-growing areas of South Australia there is quite enough lime in the soils to supply the very small quantity required by the crops, and so lime is usually applied as a soil amendment rather than as a fertilizer. As a soil amendment lime corrects acidity, and overcomes bad mechanical conditions, particularly the tendency to cake of clayey soils. As a fertilizer in the conditions that obtain at Eurelia, says the Superintendent of Experiments (Mr. W. J. Spafford), in reply to a correspondent, it is probable that 40lbs. per acre of carbonate of lime, as suggested, would have practically no advantageous effect whatever, but very finely ground and applied at the rate of 10cwts. to 1 ton to the acre it would have a very marked effect on the condition of the soil.

## INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

"J. F. W.," "Glen Brook," Macclesfield.

Reply—Your wethers are suffering from pizzle disease. This is a form of urinary calculus, consisting of various salts derived from the food, which is probably over nutritious. Treatment is to make an opening with the knife as you have done, and bathe with hot solution of soda or Condy, and give from 15 to 20 drops of tr. camphor two or three times daily till better.

"N. McL.," Mena Murtee, N.S.W., has blood filly, three years, with injury to neck while being broken, at junction of head and neck. Carries head low, and unable to raise more than foot off ground; at trot head sways as if without control.

Reply—As suggested, the accident probably occurred through rearing and falling on poll. It is impossible without examination to say where the injury lies, but the symptoms all point to fracture of wing of the atlas. Practically the only treatment feasible is to leave her in good grass feed. If she is quiet a little arnica lotion may be applied. Should there be pressure on the spinal cord from inflammatory fluid, or should the fracture extend to the body of the bone, she may be found dead at any time. If things go well she should have a year before being handled again.

"V. B.," Cummins, has horse, eight years, suffering with mange.

Reply—The symptoms point to mange caused by a mite, but this point can only be settled by a personal examination. The treatment has been frequently given in these replies. The main lines are washing at three weekly intervals with soft soap and coal tar disinfectant, and dressing afterwards and every three days with benzine 1 part, olive or raw linseed oil 5 parts. Give a dessertspoon of sulphur in food twice weekly.

"Mrs. H. A. J.," Edillilie, asks if it is safe to feed weevily chaff to horses.

Reply—Weevily chaff, having lost much of its nutriment, and gained other substances of a toxic nature, cannot be recommended for horses, and many instances of its harmfulness are to hand. The only satisfactory way of preventing it doing harm is not to give it. But where it must be fed, feed good, sound bran with it. Spread the chaff out in a thin layer in the sun for some hours before use, and scatter 1lb. of quicklime to the 100lbs. on it, and stir it in.

"Miss B. T.," White's Flat, Port Lincoln, seeks information regarding horse.

Reply—The symptoms described indicate that your horse has a splint. As you have applied several blisters without success in removing it I would advise you to wait, and you will find as time goes by that Nature will reabsorb it to a great extent. You may assist this process by rubbing it for some minutes daily with a smooth stick, such as a spoke.

"L. A. von D.," Halidon, has foal with lump on knee.

Reply—You do not specify age of foal or character of lump, whether hard or soft, so it is difficult to advise. Presuming it is a soft swelling, lance when ripe, and after evacuating contents, having taken the utmost care to avoid opening a synovial sac, swab out the cavity with tr. iodine. In the absence of further detail I would not recommend a blister.

"H. S.," Yurgo, reports calves dying, and sow paralysed.

Reply—The symptoms of your calves seem to point to eating the poison bush *gyrostemon*, or cross, as it is called. In addition, from the symptoms of the last, they also have stomach worms, microscopical. The deaths being so sudden there is not much chance of successful treatment, but a dose of milk and limewater might be of use, half a pint of each. This given twice daily to the sick one would help. Sow.—The symptoms point to worms. Give a dessertspoon of a powder made of equal parts sulphur, sulphate of iron, nux vomica, and 4 parts charcoal twice daily in feed. Rub her back well with embrocation daily.

"J. S. B.," Pinnaroo, has mare with injury to eye.

Reply—The condition of your mare's eye is technically known as ulceration of the cornea, resulting from injury by a prickle such as a thistle; it will take many months recovering, and probably there will always be a white speck at the seat of the injury. The drops from the doctor were probably not as strong as those used in veterinary work, and I would advise a lotion of nitrate of silver 6grs. to 1oz. distilled water, to be used daily as drops and a block hung over the eye damped with a lotion consisting of tr. calendula 1oz., methylated spirit 4pt., distilled water 4pt.

"B. W.," Hartley, has gelding, sore and foul-smelling hind foot.

Reply—The trouble in the horse's heel has arisen from an injury to the frog, and there is suppurating under the heel. It would be well to stand the foot in a bucket of warm water in which a few knobs of bluestone have been dissolved for an hour or two daily. After drying apply a Venice turpentine poultice to the heel, and when it begins to show signs of mending, then apply Stockholm tar daily instead of the other dressings.

"J. H. D.," Yeelanna, has cows, paralysed.

Reply—Your cows are suffering from that form of breakdown commonly called dry bible. Prevention consists in giving a varied diet, including maize or lucerne, and allowing them a lick consisting of 4 parts bonemeal and 1 part saltpetre. When affected give them a pint of yeast in beer or milk once daily, and the following powder three times daily:—Sulphur, saltpetre, sulphate of iron, nux vomica, 1 drachm each; for instance, if you mix a quarter of a pound of each, a flat tablespoon of the mixture would be a dose. Give in beer or milk. When the throat is quite paralysed milk may be passed into the stomach by a rubber tube down the throat.

"H. T.," Tod River, West Coast, reports horse with greasy heels.

Reply—Your horse has greasy heels. Wash thoroughly with hot water and soap to get the grease out; only do so once, then dress daily with a lotion consisting of sulphate of zinc 1oz., sugar of lead 1oz., water 1pt., methylated spirit 1pt. Also give in food a dessertspoon of sulphur daily for a fortnight, and then twice weekly. In the advanced condition you have described the disease is practically incurable.

"W. G.," Yeelanna, has mare with swelling on leg.

Reply—It is very difficult to diagnose your mare's condition without an examination, but assuming that the swelling is a varicosity of the vein inside the leg, you would find that bathing with hot water and vinegar would do good, and it would be well to give a teaspoon of extract of hamamelis on the tongue night and morning for a fortnight.

"F. P. H. L.," Mindarie, has horse with swelling on knee.

Reply—The swelling you describe is a synovial distension, and very probably connected, as you suppose, with rapping a rail. I think a series of three liquid blisters at intervals of three weeks would be likely to reduce it. The prescription for the blister is:—Pulv. canthar. 2drs., gum camph. 5grs., ol. lavend. m.x., ol. oliv. 1oz.

#### AGRICULTURAL INQUIRIES.

[Replies supplied by the Superintendent of Experimental Work,  
Mr. W. J. SPAFFORD.]

"J. B.," Willaston—Seed of *Cichorium intybus* (chicory) is obtainable from local seedsmen, and as a rule, from coffee merchants. During last season the seed was sold to growers at 9s. to 10s. per lb., but this price is the result of the existing

war conditions, and before war the price ranged somewhere around 1s. 9d. per lb. This plant becomes a weed, as is evidenced in the city park lands, and on the strips of land along the railways, but so far it has not become a trouble on cultivated land, because it is easily killed by the cultivating implements. In any case it would never be a weed to worry over, as it is liked by livestock, and one on which cows and sheep do well.

"B. B. R.," Arno Bay, mentions that he has some English malting barley which he is keeping for seed. He desires to know whether, if he pickled it with bluestone, the weevil would be killed, and whether the grain would be suitable for seed in a month or two's time.

Reply—I have never seen mentioned the effect of pickling weevily grain with bluestone, but I take it that all weevils, eggs, and larvae will be killed for a certainty, particularly if the grain is kept in the solution for some time. There is also a big chance that the coating of bluestone left on the grains will prevent the re-infection by the insects. The pickling of the grain a couple of months before seeding does not affect the destruction of "smut," nor the germination of the grain, providing always that the grain is fairly dry before it is rebagged. I would suggest for the weevily sample of barley that you use a  $1\frac{1}{2}$  per cent. solution ( $1\frac{1}{2}$  lbs. bluestone in 10 galls. of water). Put the barley in loose butts containing about half a bag, and dip pickle in the above solution, being certain to keep the whole bag covered over with solution for three to four minutes; take out butts, drain off excess of solution, and spread grain on a floor about 6 in. deep, to thoroughly dry before rebagging; use bags that have been pickled for holding the grain when dry. We do not usually recommend dip-pickling, but in your case it should make a surer job of destroying the weevils in all their stages. Both bluestone and formalin are first rate "pickles" for bunt, but we usually recommend bluestone because it is harder to adulterate than is formalin. If the purchaser insists on obtaining dark blue and large crystals he can be certain he has "bluestone," as the only adulterant cheap enough to be worth using is sulphate of iron, and this invariably consists of comparatively small crystals. Formalin is a solution of a colorless gas in water, and the standard article sold is supposed to be a 40 per cent. solution, but it is very easy to vary this strength by the addition of more water. In any case there is not much choice in the above two, if the formalin is guaranteed, and ordinary intelligence used in the work. We always stick out that pickling on the floor, and turning with shovels gives the best results, but really it does not matter much how the pickling is done, providing that it is done every year (whether bunt is visible or not in the seed), and when the solution is made correctly. Unless the seed is really badly affected 1 per cent. solution of bluestone and  $\frac{1}{2}$  per cent. solution of formalin is all that is necessary to keep the disease in check.

### DRAKE.

"Wheat does not change into drake, nor is the latter a cross between wheat and oats," said the Director of Agriculture (Professor Arthur J. Perkins), in reply to a correspondent, who stated that he had had large patches of drake in wheat crops two years in succession. The Director continued that drake was a weed closely allied to rye grass. So far as he was aware, it had no market value. It would be unwise to feed drake to livestock, since it had the reputation of being more or less poisonous, and of giving rise at times to serious trouble. Drake seed germinated like the seed of any other plant, and if it was bad in crops, it had either been introduced there with the seed, or else it was present in the ground before sowing. It was much more prevalent in wet years than in dry ones.

## ROSEWORTHY AGRICULTURAL COLLEGE HARVEST REPORT—1917-1918.

[By W. J. COLEBATCH, B.Sc. (Agric.), M.R.C.V.S., Principal of  
Roseworthy Agricultural College.]

### GENERAL REMARKS.

The season that has just terminated proved to be the heaviest from the point of view of grain production in the history of the College. In 1916 there were harvested 10,786bush.; in 1909, 11,895bush.; and in 1917, 12,940bush. of grain. The wheat crops were very little above the average, but the barley yields were exceptionally good, the average yield for all varieties being 41bush. 32lbs. per acre.

The total area under crop was 712.728 acres, and from this there were gathered 116 tons of Berseem clover, 78 tons of ensilage, 153 tons of hay, 200 tons of straw, 784bush. of pease, 305bush. of oats, 30bush. of rye, 5,235bush. of barley, and 6,586bush. of wheat. In addition 22 acres of pease were reserved for grazing, and a block of about 30 acres was devoted to special breeding and selection plots, the produce of which is not taken into account. The quality of some of the late wheats, which were grown under adverse circumstances as regards soil conditions and the time of seeding, was not up to our usual standard, and some of the barleys suffered in the same way. On the whole however, we must regard the past season as a very satisfactory one in this district, both for crops and livestock. The main features of the year were a late and difficult seeding, an abnormally wet winter, and a late, but relatively cool, harvest.

### WEATHER CONDITIONS.

It is generally conceded that the most potent factor in determining crop yields is the weather, and in a relatively dry district the element of prime importance is the rainfall.

#### "FALLOW" RAINS.

In the first place we must consider the rainfall during the year preceding the sowing of the crop, since by far the greater part of the area under cereals is sown on fallowed land. The fallow-ploughing period on most farms extends from June to the end of September, and, as a rule, the preparatory work in connection with seeding will have commenced early in April, hence if we take cognisance of the rain that falls between August 1st and March 31st we will obtain a fair basis of comparison between seasons from the point of view of "fallow" rains.



TABLE I.—*Showing "Fallow" Rains—August 1st of one year to March 31st of succeeding year, 1905-17—Comparatively with the mean for 34 years, 1883-1916.*

Season.	In.	Season.	In.
1904/1905 . . . . .	7.18	1911/1912 . . . . .	5.88
1905/1906 . . . . .	7.96	1912/1913 . . . . .	13.00
1906/1907 . . . . .	11.29	1913/1914 . . . . .	13.07
1907/1908 . . . . .	9.13	1914/1915 . . . . .	3.86
1908/1909 . . . . .	9.51	1915/1916 . . . . .	9.08
1909/1910 . . . . .	17.56	1916/1917 . . . . .	14.79
1910/1911 . . . . .	11.41		
Means . . . . .		1883/1916 . . . . .	9.32

These figures serve to show that the fallows in April, 1917, were well stocked with reserve moisture, and no doubt the high water content of our soils immediately prior to the continuous autumn showers intensified the difficulties of seeding. The growth of weeds was quickened, and the saturation of the surface soil was hastened and maintained, with the result that seed bed preparation was unusually difficult and costly. The "fallow" rains were the heaviest recorded since 1909, and they exceeded the mean fall by nearly 5½ in.

#### TOTAL RAINFALL, 1917.

We have next to examine the total rainfall recorded during the year 1917.

TABLE II.—*Showing Monthly Rainfall at Roseworthy College for Seasons 1913-1917 inclusive, together with the Mean Fall for each Month during the period 1883-1916 (34 years).*

	1913.	1914.	1915.	1916.	1917.	Means.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
January . . . . .	0.11	0.27	0.81	1.15	0.58	0.82
February . . . . .	1.94	1.62	0.04	0.16	2.12	0.55
March . . . . .	1.63	0.73	0.30	0.62	0.96	0.87
April . . . . .	0.31	1.38	1.95	1.36	0.68	1.63
May . . . . .	0.31	0.94	3.01	0.88	3.98	1.73
June . . . . .	0.22	0.45	4.61	5.18	2.17	2.64
July . . . . .	0.69	1.32	1.89	2.75	1.92	1.88
August . . . . .	1.64	0.39	1.83	3.00	2.60	2.05
September . . . . .	2.55	0.29	3.56	1.82	3.00	1.82
October . . . . .	3.89	0.08	1.27	1.65	1.72	1.64
November . . . . .	1.21	1.27	0.21	3.61	1.18	1.10
December . . . . .	1.16	0.62	0.28	1.05	0.95	0.78
Totals . . . . .	15.66	9.36	19.76	23.23	21.86	17.58

It will be observed that the total rain registered last year was 4.28 in. above the normal, and only 1.37 in. less than in 1916, when exceptionally fine crops prevailed. The difference in the yields obtained in these two seasons, however, is very considerable, and this fact affords but another proof that the mode of distribution of rain throughout the year is of vital importance to the farmer.

## "USEFUL" RAIN.

The following table will throw light on this question of rainfall distribution in this locality.

TABLE III.—*Showing the Distribution of "Useful Rain" in the Years 1913-1917 inclusive, together with the Means for the previous 34 Years.*

	1913.	1914.	1915.	1916.	1917.	Means.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Seeding rains (April-May) . . .	0.62	2.32	4.96	2.24	4.66	3.42
Winter rains (June-July) . . .	0.91	1.77	6.50	7.93	4.09	4.52
Spring rains (August-October) .	8.08	0.76	6.66	6.47	7.32	5.52
Summer rains (November) . .	1.21	1.27	0.21	3.61	1.18	1.10
Totals . . . . .	10.82	6.12	18.33	20.25	17.25	14.55
Percentage "useful" rain to total fall . . . . .	69.09	65.38	92.76	87.17	78.91	82.77

The total "useful" rain is seen to be 2.70in. above the mean for the preceding 34 years, but in view of the high total precipitation a fall of only 17.25in. within the growing period cannot be regarded as excessive. In 1916, with 23.23in. for the year, 20.25in. of "useful" rain, or 87.17 per cent. of the total fall, were recorded, yet with 21.86in. in 1917 only 17.25in., or 78.91 per cent., were registered.

## AUTUMN RAINS.

From an examination of Table III. it would appear that the seeding rains in 1917 were unusually heavy, and it must be admitted they were approximately 1½in. in excess of the mean fall. The records, however, reveal the fact that heavier falls have been experienced many times in former years, and hence we have to look more closely into the matter to learn the cause of the disasters that befel us in the 1917 seeding season. Reference to Tables II. and IV. will show that whereas the normal falls for April and May are 1.68in. and 1.73in. respectively, yet in 1917 we received only 0.68in. in April, and very nearly 4in., or an inch a week, in the month of May. Contrast this with the figures for 1916, and the difference in the returns for the two years will be readily understood. In April, 1916, early rains fell, and early seeding was obviously indicated, and moreover in May, the chief drilling month, there were just sufficient showers to keep the land in good order. In 1917, on the other hand, the scarcity of good drenching showers in April caused farmers to hesitate, and, with the exception of oats, very little grain was drilled, consequently the delay in May, due to long stretches of broken weather, caused grave anxiety, and led to the improvisation of methods that would under ordinary circumstances be viewed with distrust, if not openly scorned. There were

only 11 days in May on which rain was not recorded, and in the month of June, which may be considered a seeding month for this season at any rate, rain fell on 22 days.

In consequence of these continuous downpours the tilth melted away before the drills could be set going, and land that had been well fallowed had to be cultivated two or three times, and in some cases ploughed more than once in order to prepare it for the seed sower. The rains not only caused the land to run together, but in addition it encouraged the growth of dandelions and other weeds which it was almost impossible to destroy in damp misty atmosphere then prevalent. Personally I have not known a more distressing seeding season, and I am confident that if we had not resorted to the unorthodox and, under normal conditions, distinctly injudicious procedure of sowing on the old fallow surface and covering the seed with cultivators we should not have concluded seeding operations till August. As it was we were able to complete the work by the end of June, and I have reason to feel satisfied that the adoption of unusual practices was attended with better results than would have been secured had the work been postponed till normal methods could be practised.

#### WINTER, SPRING, AND SUMMER RAINS.

The winter rains were not excessive, but the spring rains were unusually copious, no less than 7.32in. being recorded for the three months, August, September, and October. The moist conditions and rising temperatures in September and October favored an early outbreak of rust (*P. graminis*), and some of the early sown oat crops were caught in a vulnerable stage, and succumbed to such an extent that they had to be utilised for silage and hay instead of being left to develop seed grain.

Towards the end of October a dry spell ensued, and some hot weather was experienced. This continued till after the middle of November, and it had the effect of arresting the spread of the rust fungus, which otherwise would have done a vast amount of harm throughout the wheat-growing centres. The late summer proved to be sufficiently moist to ensure a fair sample of grain in most cases, although yields of pinched grain were not uncommon on some types of soil, and on the College farm we were not without examples of the ill effects of sowing late varieties towards the end of June. On the whole, however, the summer was a favorable one both for the production of grain and the gathering in of the harvest.

#### SUMMARY OF WEATHER, 1917.

In the appended table are recorded further interesting data concerning the weather in this district during 1917.

TABLE IV.—*Showing Particulars of Weather experienced at Roseworthy College during the Year 1917.*

	Rainfall. Inches.	No of days on which rain fell.	Important rains		Minimum tempr. deg. Fahr.	Mean minimum tempr. deg. Fahr.	Frosts.		Max. tempr. deg. Fahr.	Mean max. tem. deg. Fahr.
			Date.	Inches.			Date.	Temp.		
January .....	0.58	3	22	0.52	45.3	57.7	—	—	111.2	86.0
February .....	2.12	5	13	0.31	44.3	57.5	—	—	101.1	82.1
			14	1.10						
			21	0.63						
March.....	0.96	6	14	0.23	49.3	57.4	—	—	95.4	80.7
			30	0.57						
April.....	0.68	7	6	0.21	38.0	47.2	29	29.8	85.6	70.6
			14	0.26			30	31.5		
May .....	3.98	20	6	0.86	39.5	48.7	—	—	71.2	61.4
			13	0.62						
			14	0.77						
			18	0.35						
			24	0.31						
June .....	2.17	17	5	0.25	32.2	43.4	8	30.6	73.2	59.8
			7	0.32			19	30.9		
			12	0.44			21	27.6		
			15	0.23			23	30.0		
			19/20	0.35			25	30.5		
July .....	1.92	17	4	0.22	38.2	45.2	28	27.0	66.9	59.2
			16	0.22			30	31.5		
			19	0.39						
			27	0.23						
August .....	2.60	15	2	0.21	34.8	42.5	23	29.0	74.8	61.4
			8	0.20			24	27.6		
			19	0.23			25	26.3		
			21	0.57			26	26.0		
			22	0.27			27	28.0		
			30	0.40			28	29.3		
			31	0.38						
September .....	3.00	16	1	0.22	36.2	44.6	—	—	82.2	66.8
			4	0.22						
			6	0.23						
			12	0.63						
			16	0.45						
			17	0.35						
October .....	1.72	15	5	0.21	33.5	47.3	8	31.4	91.3	70.0
			18	0.22			9	29.2		
			19	0.36			10	30.6		
			20	0.37						
November .....	1.18	8	21	0.54	39.2	51.4	—	—	92.1	75.7
			22	0.21						
			23	0.28						
December .....	0.95	5	12	0.49	44.3	59.8	—	—	106.4	86.5
			18	0.22						
			31	0.20						
Totals.....	21.86	134					18 Frosts			

In summary it may be said that the season 1917 was a good grass year and an average hay and grain year. The crops were not subjected to rough stormy weather in the spring or early summer, and consequently harvesting operations were not hampered by "down" crops

to any extent. There was one series of frosts in August which lasted for six days, but very little damage was done, and, generally speaking, the weather was mild throughout the growing period.

#### BERSEEM CLOVER.

An area of 4.007 acres was devoted to Egyptian or Berseem clover (*Trifolium Alexandrinum*) in 1917. There were two blocks, one of 1.994 acres (irrigation plot AB), and one of 2.013 acres (irrigation plot EF). The smaller plot was under Berseem in 1916, when it received 14 tons of farmyard manure per acre, and returned over 35½ tons per acre of green fodder. The 1917 crop was given 10 tons of dung to the acre, and yielded in four cuts an average return of 32 tons 26lbs. per acre. Plot EF, which carried a crop of sorghum in the previous year, also received 10 tons of farmyard manure in 1917, but owing to unavoidable delay in harvesting the third growth the vitality of the root stocks was exhausted in seed production, and consequently a fourth cut was not secured. This depreciated the yield appreciably, and no doubt the reduction in the dung dressing also affected the returns. In all nearly 52 tons of green stuff were carted off the plot, and the acre yield came out at 25 tons 17cwt. 3lbs.

The usual mode of preparing and conditioning the seed bed and of sowing the crop was followed, and as this has been given in detail in earlier publications it is unnecessary to repeat it here. It may be pointed out, however, that the crop grown on sorghum stubble this season was sown later than the one that followed Berseem, and in our experience the heaviest returns have almost invariably been harvested from the earliest sowings.

This crop has been regularly grown under irrigation at Roseworthy College since Professor Perkins introduced it in 1912, and during the six years the average returns per acre have ranged from 20 tons 8cwt. 43lbs. in the drought year (1914) to 35 tons 11cwt. 6lbs. in 1916. The mean average of 30 tons 1cwt. 22lbs. per acre is highly satisfactory, and it is now possible to state with conviction that under conditions that suit it Berseem is capable of supplying to dairy farmers an abundance of green forage of high nutritive value during the winter, spring, and early summer months. Like all other forage crops that yield several cuts it requires careful treatment, but with proper management and under irrigation it is in my experience without an equal as a yielder of green fodder in this district from June to November.

TABLE V.—*Results of Berseem Harvest at Roseworthy College, 1917.*

Plot.	Area. Acres.	Date Cut.	Total Yield.			Acre Yield.			
			T.	C.	L.	T.	C.	L.	
A, B	1.994	June 3-July 3	17	4	2	8	17	61	
		July 24-August 25	19	12	96	9	17	2	
		September 28-October 28	20	13	64	10	7	46	
		November 30-December 11	5	16	18	2	18	22	
Totals			63	16	68	32	0	26	
E, F	2.013	July 3-July 23	10	10	50	5	4	61	
		August 25-September 7	19	0	90	9	9	19	
		October 29-November 29	22	8	71	11	3	35	
Totals			51	19	99	25	17	3	
Grand totals		4.007	—	115	16	55	28	18	12

TABLE VI.—*Showing Yields of Greenstuff Obtained from Irrigated Berseem Clover at Roseworthy College, 1912-1917.*

Year.	Area. Acres.	Total Yield.			Yield per Acre.		
		T.	C.	L.	T.	C.	L.
1912	1.19	38	12	56	32	9	18
1913	3.201	108	19	97	34	0	111
1914	2.294	46	16	94	20	8	43
1915	3.411	98	16	66	28	19	53
1916	4.643	165	1	48	35	11	6
1917	4.007	115	16	55	28	18	12
Means					30	1	22

## ENSILAGE.

At the opening of the ensilage season for 1917 we had two pits still on hand, and, therefore, did not require to ensile as large an area as usual. The best ensilage is made from maize and sorghum, or from pease; but in this district these crops at times fail us, and consequently we prefer to rely upon autumn sown cereals. The solid strawed early wheats, like King's Red or White, suit the purpose very well. They settle down well in the pits when chaffed, and they are ready for cutting at a convenient time of the year. In 1917, however, we had to depart from our usual practice for the reason that the Scotch Grey oats began to show signs of rust, and it was deemed expedient to chaff them into the silos. During the second week in October the binders were set going, and it will be seen from the appended tables that the returns averaged nearly  $8\frac{1}{2}$  tons of greenstuff per acre. The proportion of water in the crop at the time of cutting was very high, and care had to be taken to allow the sheaves to wilt before carting. Neglect of this precaution when making silage with very watery materials has not infrequently led to disappointment, and probably the silage system instead of lack of experience in the method of manufacture has been blamed. The drier the material as it enters the silo the greater the risk of loss through fermentation; but there is a happy mean between these two extremes, and the aim should be to modify the method of treatment

in accordance with circumstances so as to have the chaffed material about as moist as green wheat crops would be when cut during the blooming stage.

TABLE VIII.—*Showing Particulars of Cereal Ensilage Harvest in 1917.*

Field.	Area.	Total Yield.			Acre Yield.		
	Acres.	T.	C.	L.	T.	C.	L.
5A . . . . .	6.138	50	17	96	8	5	93
16 . . . . .	3.038	27	0	100	8	18	5
Totals . . . . .	9.176	77	18	84	8	9	98

TABLE VIII.—*Showing Yields of Ensilage, 1905-1917.*

Year.	Rainfall.		Area. Acres.	Total Yield.			Yield per Acre.		
	"Useful."	Total.		T.	C.	L.	T.	C.	L.
1905 . . . . .	14.23	16.71	—	—	—	—	8	10	0
1906 . . . . .	16.81	19.73	9.50	113	1	0	11	18	0
1907 . . . . .	13.96	15.13	17.15	92	2	75	5	7	34
1908 . . . . .	15.52	17.75	17.00	129	10	76	7	12	44
1909 . . . . .	21.15	24.05	16.962	169	18	90	10	0	3
1910 . . . . .	16.79	23.87	15.490	134	1	43	8	15	32
1911 . . . . .	9.45	13.68	30.740	152	16	28	4	19	47
1912 . . . . .	13.05	14.97	40.700	141	4	73	3	9	45
1913 . . . . .	10.82	15.66	61.511	115	14	24	1	17	70
1914 . . . . .	6.12	9.36	—	—	—	—	—	—	—
1915 . . . . .	18.33	19.76	27.384	153	14	107	5	12	33
1916 . . . . .	20.25	23.23	12.443	103	11	28	8	6	51
1917 . . . . .	—	—	9.176	77	18	84	8	9	98
1905-17 (Average for 12 years) . . . . .							7	1	57

#### RELATION BETWEEN ENSILED CEREAL CROPS AND AMOUNT OF TWINE USED.

From the data set out in the following table it is seen that when cereal crops are cut at about the flowering stage an allowance of one ball of twine to every  $4\frac{1}{2}$  to  $4\frac{3}{4}$  tons should be made. Assuming an average yield of 7 tons of greenstuff, this works out at between one and a half and one and two-third balls per acre.

TABLE IX.—*Showing Quantity of Crop Cut for Silage per Ball of Twine Used.*

Year.	Area. Acres.	Total Yield.			Acre Yield.			Weight of Crop Cut.		
		T.	C.	L.	T.	C.	L.	T.	C.	L.
1915 . . . . .	27.384	153	14	107	5	12	33	4	7	55
1916 . . . . .	12.443	103	11	28	8	6	51	4	16	38
1917 . . . . .	9.176	77	18	84	8	9	88	4	14	52
Average . . . . .					7	9	61	4	12	36

#### THE HAY CROP.

Owing to the large stacks of hay on hand it was unnecessary to cut a large area in 1917. At seeding time it was anticipated that a field of 21 acres, together with the usual headlands and divisions, would

suffice for the hay harvest, but the rapid spread of red rust in the Scotch Grey oats compelled us to include another 27 acres, which brought the total hay area up to 74.58 acres. The wheaten hay was of first-class quality, and was saved in good order; but the oaten sheaves proved very light and feathery, and being cut at least a month too soon, there was no grain in the heads to give weight and nutriment. The density of the oat crop may be inferred from the fact that notwithstanding the diseased and immature condition of the plants at harvest, the acre yield amounted to 2 tons 55lbs. The whole of the hay was carted and stacked by the 13th December, and consequently did not suffer from prolonged exposure in the field. The losses sustained by cereals when allowed to remain in stook for protracted periods is very considerable, and particularly so when it is exposed to the leaching effects of summer rains. Weathered fodder is not only poorer in the elements of nutrition, notably in soluble carbohydrates, but, in addition, the quality of the fibre is impaired, and the digestible coefficient is depreciated. These facts are not always fully realized, and I cannot but think that if more importance was attached to the saving of our hay crops at the earliest possible moment after they are dry enough to stack, it would be very much better for our livestock, and distinctly economical as regards the purchase of concentrated foodstuffs. In more humid climates, where summer rains are heavier and more frequent, greater attention is paid to this matter, and although I fully realize that in districts where early wheats predominate, and hence where the hay and grain harvests very often overlap, it is not by any means a simple matter to observe the dictates of science in their entirety; yet I have little doubt that there is a greater tendency to take risks with our sunny climates than should be. If it were possible to establish hay standards on the basis of nutritive values, and to conduct commercial transactions on these values, there would probably be very little occasion to lay emphasis on the importance of early hay carting. At present the quality of hay is judged solely by physical test, and whilst these enable a rough system of grading to be adopted, they do not enable us to determine feeding values with any degree of precision.

Whilst I foresee no immediate prospect of remedying this position of affairs, I think farmers would do well to remember that hay is the mainstay of our horseflesh, and, further, that farm teams cannot be expected to stand the severe strain of seeding and fallowing operations, and at the same time maintain their health and condition, when fed on inferior chaff. I have not the slightest doubt that many of the losses in large stock sustained in our farming districts,



wheat, broadcast after the drill with lucerne, and bind the crop or indirectly to insufficient care in discriminating between good and inferior hay. This would be obviated in great measure if every effort were put forth to bring the hay into stack before it had been depleted of its soluble constituents and rendered less digestible and assimilable by the action of the weather.

TABLE X.—*Showing Particulars of 1917 Hay Harvest.*

Field.	Area.	Total Yield.			Acre Yield.		
	Acres.	T.	C.	L.	T.	C.	L.
7A . . . . .	21.064	51	17	31	2	9	27
5A . . . . .	27.081	54	16	68	2	0	55
Headlands . . . . .	26.435	46	8	94	1	15	15
Totals . . . . .	74.580	153	2	81	2	1	6

## FIELD No. 7A.

The prior history of this field is as follows:—

1897 .. Pasture	1906 .. Kale
1898 .. Wheat	1907 .. Maize and sorghum
1899 .. Pasture	1908 .. Barley
1900 .. Oats	1909/11 Sown grasses
1901 .. Pasture	1912 .. Maize, sorghum, and bare fallow
1902 .. Oats	1913 .. Barley, oats, and lucerne
1903 .. Sorghum	1914 .. Pasture
1904 .. Bare fallow	1915 .. Bare fallow
1905 .. Wheat and oats	1916 .. Wheat

Contrary to usual practice, this field was under wheat for two successive seasons, and on both occasions the crop was cut for hay. Up to 1916 it had been used mainly as a home grazing field; only three crops of wheat had been grown on it during the preceding 20 years. As indicating the high state of fertility of the land, it may be mentioned that in 1916 it returned 3 tons 13cwts. 80lbs. of wheaten hay per acre. Partly on this account, but more particularly because of the advisability of establishing a lucerne pasture adjacent to the steading, it was decided to sow it early with a quickly maturing wheat, broadcast after the drill with lucerne, and bind the crop for hay, so as to give the lucerne seedlings an opportunity of getting firmly rooted. The field was broken up in February; rolled and cultivated during the first week in May. The drill closely followed the cultivator, sowing 120lbs. King's White wheat, Selection 9, and 2cwts. superphosphate to the acre. As soon as the weather conditions would permit after germination 6lbs. of Hunter River lucerne was broadcasted on a rolled surface and the seed covered with light

American weeders. The crop made excellent progress, and reached the hay-cutting stage without suffering from attacks of red rust. It yielded nearly 2½ tons per acre, and, thanks to the late spring showers, a good stand of lucerne was secured.

#### FIELD No. 5A.

The prior history of this field is summarized below:—

1897 .. Bare fallow	1907 .. Bare fallow (limed)
1898 .. Wheat	1908 .. Wheat, oats, and barley
1899 .. Wheat	1909 .. Wheat, oats, barley, and lucerne
1900 .. Bare fallow	1910 .. Pasture
1901 .. Wheat and oats	1911 .. Pasture
1902 .. Pasture	1912 .. Pasture
1903 .. Bare fallow	1913 .. Bare fallow
1904 .. Wheat	1914 .. Wheat, oats, and barley
1905 .. Bare fallow	1915 .. Pasture
1906 .. Wheat and oats	1916 .. Bare fallow

The whole of this field was sown with oats, which it was intended to harvest for grain. By the end of September, however, it became obvious that one variety, namely, Scotch Grey, would have to be turned into hay, as it began to dry off in consequence of a heavy attack of red rust. The field was fallowed in 1916, and the seed was sown under favorable circumstances during the last week of April, at the rate of 50lbs. per acre. A very thick crop resulted, and had it not been for the fungoid invasion, we should have expected a 40bush. average. It is disappointing to find this variety of oat, which in other respects has given every satisfaction, and which I still regard as one of the most useful types to grow in this district, so susceptible to this disease. It is to be remarked, however, that the rust spores appeared quite a month or six weeks earlier than usual this year, and it so happened that the Scotch Greys were caught at a disadvantage, inasmuch as the crop was unusually heavy and full of moisture. For this reason I am not inclined to condemn this variety on our experience this year, but in future I intend to sow it at the rate of a bushel or less to the acre, and arrange to have it so placed that it may be grazed off if need be.

#### HEADLANDS.

The hay obtained from headlands consists of wheat, oats, and barley cut out to make room for harvesting machines. The yield is always lighter than the paddock returns, and this year it amounted to rather more than 35cwts. per acre.

## AVERAGE HAY YIELD, 1917.

The average hay yields for the last 14 years is appended in tabular form.

TABLE XI.—*Showing Average Hay Yields on the College Farm, 1904/17.*

Year.	Rainfall.		Area. Acres.	Total Yield.			Average Yield.		
	"Useful." Inches.	Total. Inches.		T.	C.	L.	T.	C.	L.
1904 . . . . .	11.60	14.70	93.000	238	0	0	2	11	22
1905 . . . . .	14.23	16.71	67.000	198	8	22	3	2	71
1906 . . . . .	16.31	19.73	93.000	241	0	0	2	11	96
1907 . . . . .	13.96	15.13	51.000	91	14	20	1	15	108
1908 . . . . .	15.52	17.75	112.800	293	6	23	2	7	5
1909 . . . . .	21.15	24.05	145.397	404	4	54	2	15	68
1910 . . . . .	16.79	23.87	94.900	224	7	6	2	7	31
1911 . . . . .	9.45	13.68	200.100	290	12	94	1	8	6
1912 . . . . .	13.05	14.97	248.450	432	7	49	1	14	96
1913 . . . . .	10.82	15.66	258.200	207	7	111	0	16	7
1914 . . . . .	6.12	9.36	247.647	181	13	107	0	14	75
1915 . . . . .	18.33	19.76	341.649	806	7	36	2	7	23
1916 . . . . .	20.25	23.23	121.727	374	17	8	3	1	66
1917 . . . . .	17.25	21.86	74.580	153	2	81	2	1	6
Average for 14 years . . . . .							2	2	56

From this table it will be seen that the 1917 hay returns approximated very closely to the mean average yield, but it is clear from what has already been said that from crops sown as hay crops in this district yields of  $2\frac{1}{4}$  tons to  $2\frac{1}{2}$  tons per acre were obtainable this season.

## THE AMOUNT OF HAY CUT PER BALL OF BINDER TWINE.

TABLE XII.—*Showing the Relation between a Ball of Binder Twine and the Amount of Hay Cut for the Period 1911/1916.*

Year.	Area. Acres.	Yield per Acre.			No. of Balls.	Hay Cut per Ball.		
		T.	C.	L.		T.	C.	L.
1911 . . . . .	200.100	1	8	6	120 $\frac{1}{2}$	2	6	65
1912 . . . . .	237.223	1	14	90	200 $\frac{1}{2}$	2	0	54
1913 . . . . .	228.909	0	16	6	108	1	14	3
1914 . . . . .	232.406	0	14	78	85	2	0	17
1915 . . . . .	341.649	2	7	23	406	1	19	81
1916 . . . . .	121.727	3	1	66	166 $\frac{1}{2}$	2	5	3
1917 . . . . .	74.580	2	1	6	94	1	12	65
Average for 7 years . . . . .		1	14	87	—	1	19	89

The weight of hay cut per ball of twine this season was unusually low on account of the fluffy nature of the oaten sheaves. Being cut on the green side, when full of sap, the amount of twine used up was abnormally high, in fact, there were approximately 41 balls utilized in connection with the 53 tons of oaten hay. The effect of this has been to depress the mean figures by 23lbs. per ball.

## EXPERIMENTAL FARM HARVEST REPORTS.

### EYRE'S PENINSULA EXPERIMENTAL FARM.

[By W. J. SPAFFORD, Superintendent Experimental Work, and  
L. J. Cook, Manager.]

This farm consists of 3,041 acres, comprised of the sections 26, 27, and 28, in the hundred of Minnipa, and situated 158 miles north of Port Lincoln, on the Port Lincoln to Cape Thevenard railway. It is fairly centrally situated as concerns the whole of Eyre's Peninsula, and is the point from which departmental activities in agricultural matters on that vast stretch of arable land will proceed. The most of the farm will be arable when the natural growth is removed, and consists of soils varying from light-colored, light-textured sands, growing broom-bush and porcupine, to heavy calcareous soils, with a tendency to run together and set hard; but the bulk of the block is between these two extremes, and consists of calcareous soils of medium texture, growing naturally mallees and large bushes. The above-mentioned sections were dedicated "a reserve for agricultural purposes" in November, 1914, and work was started and a manager appointed on January 1st, 1915.

#### THE SEASON 1917.

The year opened with the abnormal rainfall of 2.02in. in January. Such an amount of rain would be useful on fallowed land that was rather loose, to compact it together again and to germinate some of the weed seeds, but as we had no land fallowed at this farm, and were making every effort to get the mallees that had been grubbed burnt up, this rain was practically wasted, and was a nuisance at the same time. The February and March falls, with 40 points and 94 points respectively, were higher than expected or than is necessary for cereal growing, but April only produced 42 points, which amount could be much improved on in such an early district as is Minnipa. May yielded the very useful amount of about 2½in., and from then onwards during each month good falls were recorded. The total rainfall for the 12 months was 21.69in.

In the table set out below will be found the distribution of the rainfall recorded at this farm since its commencement in January, 1915.

*Rainfall Distribution at Minnipa, 1915-1917.*

	1915. In.	1916. In.	1917. In.	Means. 1915-17. In.
January . . . . .	0.74	0.80	2.02	1.19
February . . . . .	0.09	0.04	0.40	0.18
March . . . . .	0.02	0.44	0.94	0.47
April . . . . .	1.18	0.27	0.42	0.62
May . . . . .	2.03	1.23	2.84	2.03
June . . . . .	1.88	3.67	2.64	2.73
July . . . . .	2.54	3.60	3.08	3.07
August . . . . .	3.57	2.55	3.17	3.10
September . . . . .	0.98	2.33	2.81	2.04
October . . . . .	0.41	1.92	1.46	1.26
November . . . . .	—	1.05	1.58	0.88
December . . . . .	0.44	0.12	0.83	0.30
Totals . . . . .	13.88	18.02	21.69	7.86
Total "Useful" rain (April-November) . . . . .	12.59	16.62	18.00	15.74

Despite the fact that 2in. of the total rainfall fell during January, and so was of practically no use to the crops grown, there was still 18in. of rain that can be taken as being useful to the cereals grown. This "useful" rain, divided into the amounts falling in different periods, is displayed in the table below:—

*Distribution of "Useful" Rainfall in 1917, Comparatively with the Means for 1915-1917.*

	1917. In.	Means. 1915-1917. In.
Seeding rains (April-May) . . . . .	3.26	2.65
Winter rains (June-July) . . . . .	5.72	5.80
Spring rains (August-October) . . . . .	7.44	6.40
Early summer rains (November) . . . . .	1.58	0.88
Total "Useful" rain . . . . .	18.00	15.74

For the conditions that obtain at Minnipa the distribution of the "useful" rainfall disclosed in the above table is really good for the growth of cereal crops, and even though the crops were not sown on fallowed land, if red rust had not made its appearance, really heavy crops of grain would have resulted. As a matter of fact, despite the lack of fallow and the presence of the above-mentioned disease, the yields shown below are really good.

CROPS.

The crops grown this year were of necessity only cereals, for the farm was only commenced in January, 1915, and all clearing is being

done thoroughly, i.e., grubbed. This grubbing of the land restricts very considerably the area cleared each year, and so the area of new land under crop for this, the third, year was comparatively little.

The year 1916 was a very unsuitable one for clearing operations at Minnipa because, although the weather was favorable to tree and bush pulling, there was not enough hot, dry weather to allow of the growth being burnt up. This was a great drawback to the whole work of the farm, for instead of clearing up blocks in a few days, they took weeks of burning, and then left much stuff to be picked up by hand. This position arose because of the fact that most of the trees pulled are from 9in. to 2ft. in diameter, and with correspondingly large root stocks, and such trees, even when dry, take much hand work in keeping the butts together to burn them out properly; when not properly dry and with bad burning weather the whole job becomes very difficult. The poor burning weather gave no chance of cleaning up land in time to fallow it, and as the land cropped in 1915 and that cleared in 1915 was all under crop in 1916, there was no land worked as bare fallow to be cropped this year. The crops sown were either on stubble land worked up between harvest and seeding, or on "new" land worked just before putting in the seed.

*Hay Crops.*—Part of Field No. 2, which carried wheat in 1916, was ploughed up during the period March 30th to April 10th, 1917, and was drilled in as follows, the harrows following the drill:—From May 7th to 10th about 17 acres were drilled in with Algerian oats, from May 10th to 12th about 19 acres drilled in with Baroota Wonder wheat, and from May 12th to 14th about 14 acres drilled in with King's Red wheat. The whole block received a dressing of a little over 1cwt. superphosphate to the acre with the seed. All of the oats and the bulk of the wheat was cut for hay, with the results shown below:—

*Hay Yields—Minnipa, 1917. Field No. 2—Stubble Land.*

	Area.	Total Yield.			Yield per Acre.		
	Acres.	T.	C.	L.	T.	C.	L.
Algerian Oats . . . . .	17.17	34	0	0	1	19	68
King's Red . . . . .	10.24	17	10	0	1	14	20
Baroota Wonder . . . . .	15.07	25	0	0	1	13	20

These returns are very satisfactory for crops sown on stubble land; but in such a wet season as the one under review the yields, particularly of the wheats, might have been higher. This is possibly accounted for by the following facts:—(a) The land in 1916 carried a very heavy crop of wheat (35bush. to the acre), and a portion of it also carried a hay crop in 1915. (b) Only 63lbs. of seed was used to the acre; this light dressing was in anticipation of much self-sown wheat in the crop, but it did not prove so. (c) The rather poor seed bed that naturally

followed the late preparation of the land led to a rather poor germination, particularly of the Baroota Wonder. Before summarising the hay yields, there must be added to the above the yields received from the headlands of the wheat fields. An area of 5.37 acres was cut out for hay from the headlands of the grain fields, and produced 6 tons of hay for an average yield of 1 ton 2cwts. 39lbs. to the acre.

Altogether 82 tons 10cwts. of hay were cut from 47.85 acres for an average yield of 1 ton 14cwts. 54lbs.

In the table below the hay returns received at the farm since 1915 are set out, with the mean yield for the period :—

*Hay Returns—Minnipa, 1915-1917.*

Year.	Total Rainfall.	Useful Rainfall.	Area.	Total Yield.			Yield per Acre.		
	In.	In.	Acres.	T.	C.	L.	T.	C.	L.
1915 . . . . .	13.88	12.59	148.00	280	0	0	1	17	94
1916 . . . . .	18.02	16.62	2.34	4	0	0	1	14	19
1917 . . . . .	21.69	18.00	47.85	82	10	0	1	14	54
Means . . . . .	17.86	15.74	—	—	—	—	1	15	56

*Oat Crops.*—The oat crops sown for grain were put on "new" land in Field No. 13. The portion of the field carrying the oats was ploughed as the land was cleaned up, between April 10th and May 7th, 1917, and as each block was finished it was cross raked, which operation not only removes the lateral roots of the mallees brought up by the plough, but is a good surface cultivation. On May 22nd and 23rd about 10 acres were drilled in with 70lbs. Scotch Grey oats and 130lbs. superphosphate to the acre, and about  $\frac{1}{2}$  acre of Algerian oats was drilled in at 55lbs. seed and 130lbs. superphosphate to the acre. These two plots germinated well, and made thick heavy growth, and the sample of grain secured is good. The Scotch Grey variety ripened off rapidly, and was ready to harvest on November 17th, which was about 12 days to 14 days earlier than the Algerians. The yields from these two blocks of oats are shown below :—

*Yields of Oats—Minnipa, 1917. Field No. 13—New Land.*

	Area. Acres.	Total Yield. Bush. lbs.	Grain per Acre. Bush. lbs.
Scotch Grey . . . . .	9.84	441 20	44 35
Algerian . . . . .	0.55	20 2	36 18
Farm average . . . . .	10.39	461 22	44 17

As this was the second year in which oats have been grown for grain at this farm, we can start our average yields for this crop, and in the following table this is set out for the period 1916-1917:—

*Oat Returns—Minnipa, 1916-1917.*

Year.	Total Rainfall. In.	Useful Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1916 . . . . .	18.02	16.62	49.90	1,987 20	39 33
1917 . . . . .	21.69	18.00	10.89	461 23	44 17
Means . . . . .	19.85	17.31	—	—	42 5

*Barley Crops.*—A block of “new” land in Field No. 2 was ploughed with a disk plough as soon as it was burned and cleaned up, which operation only took place in the period June 15th to June 28th. On June 28th and 29th about 8 acres of this freshly ploughed land was sown with Short Head barley at the rate of 70lbs. seed and 200lbs. superphosphate to the acre. This seed was very little more than scratched into land that had a lot of dry spear grass still on it, owing to the difficulty of burning the rubbish on this block. The crop germinated well, and only made short straw growth, but it headed up well, and the return of grain is good for such bad mechanical condition at seeding. In all 233bush. 34lbs. of barley was harvested from 7.13 acres, averaging 32bush. 39lbs. to the acre.

*Rye Crops.*—On about 4 acres of “new” land that was ploughed as soon as cleaned up—some time early in May, 1917—rye was sown at the rate of 65lbs. seed with 1cwt. superphosphate to the acre. The seed did not germinate too well, and so the crop was rather thin; but the plants made good growth, the best patches being over 6ft. high. The 3.86 acres harvested produced 61bush. 54lbs. of grain for an average yield of 16bush. 2lbs. to the acre.

*Wheat Crops.*—Practically all of the wheats grown for grain are true to type, and are put in with the object of supplying good seed wheat to local farmers. That this is appreciated is clearly shown by the sales last year, which absorbed all of the seed wheat that we had to offer, and again this season, when most varieties were over-applied for before the crops were harvested. Besides the production of seed wheat, we are testing the capabilities of new crossbred wheats that originated and have done well at Roseworthy Agricultural College. For this year (1917), the varieties of wheat behaved as is set out in the table



below, which, besides the yields, shows in what fields the crops were grown:—

*Wheat Variety Yields—Minnipa, 1917.*

Variety.	Field Grown.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
<i>"New" Land—</i>				
Caliph . . . . .	No. 13	6.52	206 10	31 37
Marshall's No. 3 . . . . .	No. 13	3.20	94 21	29 29
Yandilla King . . . . .	No. 13	3.27	94 57	29 2
Canaan . . . . .	No. 2	1.64	46 21	28 16
Fape . . . . .	No. 2	0.53	14 19	27 1
Queen Fan . . . . .	Exp.	14.49	388 52	26 50
Ford . . . . .	No. 2	1.46	38 8	26 7
Fortune . . . . .	No. 2	0.54	13 42	25 22
College Eclipse . . . . .	No. 2	2.69	67 50	25 13
Exquisite . . . . .	No. 2	1.11	27 56	25 10
Anvil . . . . .	No. 2	1.51	37 27	24 48
Forge . . . . .	No. 2	0.48	11 50	24 39
Ensign . . . . .	No. 2	1.22	29 31	24 12
King's Red . . . . .	No. 2	10.67	228 12	21 23
Flamen . . . . .	No. 2	0.26	4 43	18 9
Means for "New" Land . . . . .		49.59	1,304 19	26 18
<i>Stubble Land—</i>				
King's Red . . . . .	No. 2	4.14	114 14	27 36
Baroota Wonder . . . . .	No. 2	4.81	126 27	26 17
Gluyas . . . . .	No. 13	18.11	454 34	25 6
Means for Stubble Land . . . . .		27.06	695 15	25 42
Farm average . . . . .		76.65	1,999 34	26 5

The "new" land of both Fields No. 2 and No. 13 was ploughed as it was cleaned up, which operations in the case of Field No. 13 took place between April 10th and May 7th, 1917; but in No. 2 the work was not done until between June 15th and 28th, 1917. Field No. 13 was raked across the ploughing, and as the tines of the rake were working below the surface of the land, this operation proved a good cultivation, as well as a root remover. The straw on the stubble land was burnt, and the blocks were ploughed early in April.

The wheat varieties were drilled in from May 10th to June 26th, at the rate of about 1bush. of seed to the acre, with 130lbs. superphosphate. This is the second year in which wheat has been harvested for grain at this farm, and the farm averages, with the mean for these years, is to be found in the following table:—

*Wheat Returns—Minnipa, 1916-1917.*

Year.	Total Rainfall. In.	Useful Rainfall. In.	Area. Acres.	Total Yield. Bush. lbs.	Yield per Acre. Bush. lbs.
1916 . . . . .	18.02	16.62	171.73	4,908 6	28 35
1917 . . . . .	21.69	18.00	76.65	1,999 34	26 5
Means . . . . .	19.85	17.81	—	—	27 20

As the results obtained from wheat grown on "new" land and on stubble land have been kept separate, and as wheat must of necessity be grown on such land for quite a number of years to come, the following tables, setting out these returns, will be of interest:—

*Wheat Returns from "New" Land—Minnipa, 1916-1917.*

Year.	Total Rainfall.	Useful Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1916 .. .. .	18.02	16.62	25.28	624	9	24	41
1917 .. .. .	21.69	18.00	49.59	1,304	19	26	18
Means .. .. .	19.85	17.31	—	—	—	25	29

*Wheat Returns from Stubble Land—Minnipa, 1916-1917.*

Year.	Total Rainfall.	Useful Rainfall.	Area. Acres.	Total Yield.		Yield per Acre.	
	In.	In.		Bush.	lbs.	Bush.	lbs.
1916 .. .. .	18.02	16.62	108.70	2,966	0	27	17
1917 .. .. .	21.69	18.00	27.06	695	15	25	42
Means .. .. .	19.85	17.31	—	—	—	26	29

As the wheat-growing operations of this farm have as their object the production of good seed wheat, a fair number of varieties will always be grown, and as a number of the varieties of this year were also grown in 1916, a knowledge of their behavior for the two seasons will possibly be useful to producers situated in somewhat similar conditions. The table below shows the yields obtained from the wheat varieties that have been grown for each of the two years:—

*Yields of Wheat Varieties—Minnipa, 1916-1917.*

Variety.	1916.		1917.		Means.
	Bush. lbs.		Bush. lbs.		1916-1917. Bush. lbs.
Caliph .. .. .	35	59	31	37	33 48
Queen Fan .. .. .	33	53	26	50	30 21
College Eclipse .. .. .	32	25	25	13	28 49
King's Red .. .. .	31	8	23	7	27 7
Baroota Wonder .. .. .	27	36	26	17	26 56
Gluyas .. .. .	22	22	25	6	23 44
Farm average .. .. .	28	35	26	5	27 20
Rainfall .. .. .	18.02in.		21.69in.		19.85in.

EXPERIMENTAL PLOTS.

A part of Field No. 13, consisting of "new" land that was ploughed as soon as cleaned up in the latter end of April, 1917, carried quantitative manurial plots with wheat. The land was raked across the ploughing, and Queen Fan wheat was drilled in plots about 3 acres in area with the various amounts of superphosphate on May 25th and 26th. The plots were harrowed immediately after the drill. In the preceding year (1916), Gluyas wheat was grown on the same plan, and

the returns received from these plots, with the means for the two years, are to be seen in the following table:—

*Manurial Tests with Wheat—Minnipa, 1916-1917.*

Manuring per Acre.	1916.		1917.		Means.
	Bush. lbs.		Bush. lbs.		1916-1917. Bush. lbs.
No manure . . . . .	19	56	15	35	17 45
½wt. superphosphate . . . .	22	55	26	48	24 51
1wt. superphosphate . . . .	24	11	29	39	26 55
2wts. superphosphate . . . .	28	35	31	17	29 56
3wts. superphosphate . . . .	—	—	31	9	—
Farm average . . . . .	28	35	26	5	27 20
Rainfall . . . . .	18.02in.		21.69in.		19.85in.

The yield received from the no manure plot in 1917 is hardly correct, because the plots were attacked by birds (particularly parrots) and rabbits, and as the no manure plot was quite a week later in coming to maturity than were the manured plots—as is usual in such tests—it suffered more from the above-mentioned pests than did the others. Unless the damage done by pests is confined to patches that can be cut out before harvesting the plots, there is no way of calculating the losses caused, and in this case the difference between the yield received and what was grown on the no manure plot is possibly a few bushels to the acre, but there is no way out but to record what is actually received:—

*Fields in Crop at Minnipa—1917.*

*Field No. 2.*—The soil of this field is purely calcareous, of a medium consistency in parts, running off to fairly heavy land that sets with rain rather readily after being cleared and cultivated. The portion of the field that carried the stubble crop has soil of medium consistency, and only grew a few bushes and grass when we took the land over in 1915. The bushes were pulled and burnt, and the land fallowed in 1915; wheat was grown in 1916, and produced 35bush. to the acre; the straw was burnt, and the land prepared for the 1917 wheat crops as described above. The portion of the field put in as “new” land in 1917 was covered naturally by a heavy growth of mallees and bushes, the soil being of rather a heavy texture and inclined to run together after every rain.

*Field No. 13.*—The soil of this field is of a fairly heavy nature, and has a tendency to run together with rain. When clearing operations were commenced this field carried a heavy dense growth of mallees and bushes (mainly box bush—*Alyxia buxifolia*).

GENERAL.

In Field No. 2 the cereals made but short straw growth, but the crops headed well and gave yields in excess of expectations. In this

field the King's Red wheat was the only wheat that did not germinate well, and so it made a thin crop, and did not appear to appreciate the somewhat rough soil preparation and the late seeding.

In Field No. 13 the seeding conditions were fairly good, and the crops made heavy straw growth—so much so that many patches were too rank to produce much grain.

The dry spell experienced in November ripened off the cereals rather rapidly, with the result that the grain received from the ranker crops is slightly pinched.

Some red rust affected patches of the crops, but as disclosed by the yields, the damage done by this disease was not very considerable.

Of the new Roseworthy Agricultural College crossbred wheats tried this year, Canaan and Fane stood out prominently, and produced really good samples of grain. Of the older wheats, Gluyas and Queen Fan yielded the best samples of grain, and although these varieties, in common with all others, had some rust on them, the grain produced was really good.

The oat crops germinated well, and made good healthy growth, showing no signs of diseases of any kind.

#### HORSE BEANS AND FIELD PEAS.

There is not a great deal of difference in the feeding value of the two leguminous crops, horse beans and field peas, as the digestion figures of Professor Kellner, set out below show:—

Seeds.	Crude Protein.	Crude Fat.	Nitrogen Free Extract.	Crude Fibre.	Starch Equivalent per 100lbs.
	Per cent.	Per cent.	Per cent.	Per cent.	lbs.
Bean . . . . .	22.1	1.2	44.1	4.1	66.6
Peas . . . . .	19.4	1.0	49.9	2.5	68.6

The advantage in feeding value per 100lbs., as shown in the starch equivalent column, is more than counteracted by the increased yield from the beans, and on the average figures for England of 30bush. per acre for beans, and 27bush. per acre for peas, the starch equivalent per acre is represented by 1,279lbs. for beans and 1,151lbs. for peas. In the green stage, just before flowering, the starch equivalent of beans is represented by 7.1lbs. per 100lbs., and for peas by 6.6lbs.

Beans are essentially a crop for clay and heavy lands generally, says the Superintendent of Experiments (Mr. W. J. Spafford), and given such soils there is no reason why the crop should not be absolutely successful in the Meadows district. To grow the crop properly, however, it is a more expensive operation than is that of pea-growing, for the crop should be sown in rows, and once the seeds have germinated, the land between the rows must be kept free from weeds by cultivation.

## CO-OPERATION IN MARKETING FRUIT.

### THE SOUTH AUSTRALIAN POOL.

Perhaps the most important aspect of the fruit-growing industry in this State at the present time is the development of markets for the produce. With the outlet of the overseas export practically closed on account of freight shortage it is only natural that attention should be directed to the exploitation of the home market. That the local market offers excellent opportunities for expansion cannot be gainsaid. Indeed, it can be safely said that on account of the absence of organized marketing facilities, large quantities of fruit have in the past been rotting in the orchards whilst prospective consumers went unsupplied.

With such emphasis has this question of markets been brought home to fruitgrowers that Inspector Beaumont stated, in the course of his annual report on the Horticultural Department's work in the Southern District, that the question most frequently put to him was, "What are we to do with our fruit?" On most of the orchards, two-thirds of the produce was compulsorily wasted, he continued.

The solution of the difficulty lies in the organization of the growers and the systematic exploitation of available markets. With this object in view, the South Australian Fruit Pool has now been formed, consisting of the following districts:—Barossa, Angaston, Nuriootpa, Gumeracha, Forest Range, Balhannah, Kersbrook, Blackwood, Coonawarra, Coromandel Valley. Each of these centres has a membership of most of the fruitgrowers therein, and has appointed a representative to the central committee, which consists of the following:—S. O. Smith, Barossa, Balhannah, Angaston, Nuriootpa (Chairman of the Committee); W. J. Hannaford, Gumeracha; F. Green, Forest Range; G. W. Summers, Blackwood; A. Filsell, Balhannah; E. J. Powell, Kersbrook. The Government have agreed that for the present Mr. W. Nash, an officer of the Government Department, may act as Secretary.

The duties of the central committee are to watch all avenues of trade in the interests of the growers, attend to all the necessary distribution of the fruit, carry out the advertising campaign, and generally conduct the business of the pool.

The committees of the various district centres are responsible for district organization, and for the proper collection, grading, and packing of the fruit. The objects aimed at are—(a) The placing before the South Australian consuming public of apples and fruit generally of a quality that will appeal to their tastes at a price that will induce them to become large consumers. (b) To organize the growers so that the multiplicity of marks, brands, and indifferent grading can be eliminated from trade, and to so co-operate that the very best returns can be obtained at the minimum of cost.

These objects have so far appealed very strongly to many growers, and strong support has been given to the movement; but the central committee wish to invite all fruitgrowers to manifest a personal interest in the undertaking, and if possible either join one of the centres already established or undertake the establishment of new centres in their districts.

It is pointed out to growers that some effects of the "Pool's" movement can already be seen in the strong canvass that is being made by buyers through various districts, and evidence is being brought to the central committee that 4s. per bushel (buyers providing cases and packing material) is now being freely offered growers for good apples in the orchard.

From those growers who are not members of any district the central committee invites any inquiries on the question of markets and the trade generally, while members will obtain all information through their delegate on that committee.

The committee wish to make it particularly clear that there is no intention to interfere with any trader which in the past and is still working in the interests of the fruit industry, but it considers the "Pool" is necessary to stimulate public interest, which can only be brought about by co-operation amongst growers, so that the consumer may have the advantage of the splendid fruits grown in this State.

The committee appeals strongly to the consuming public for support of the industry, and in return it intends to offer the very best apples that are grown in South Australia at prices that will allow them to take full advantage of the advice:—

Health's best way,  
Eat apples every day.

The public are advised that the Jonathans will be ripe for eating early in March, to be followed shortly after by Cleopatras and all the best of the other varieties of eating apples.

At the present time the "Pool" is advertising that they have for distribution good cooking apples of the early varieties which can be purchased at 4s. 6d. per bushel cases on rail Adelaide. The committee are thankful for the support that they have received from the Government generally and from the Minister controlling the Government Produce Department (Sir Richard Butler).

The Chairman of the "Pool" (Mr. S. O. Smith) will be pleased to answer any correspondence addressed to him at Angaston, and the Secretary can be found at the offices of the Government Produce Department.

## THE AGRICULTURAL BUREAU.

### CONFERENCES DURING 1918.

The District Conferences of the Agricultural Bureau play a big part in agricultural education in South Australia, and the popularity of these fixtures is growing year by year. The advantage of these gatherings lies in the fact that the attending delegates are interested in similar aspects of agriculture. The State is divided into districts, embracing, so far as practicable, centres concerned with identical cultural conditions.

The first Conference to be held this year is that of the Mid-Northern District, to be held at Wirrabara on Thursday, March 21st. This is to be followed by a gathering of Lower Eyre's Peninsula farmers at Yeelanna on Monday, March 25th. During the month of April representatives of the South-Eastern Branches meet at Naracoorte on Wednesday, 17th, and on Thursday, 26th, of the same month, the Upper Northern Branches meet at Orreroo. At Berri, on May 23rd and 24th, a gathering of representatives of the River Murray districts is to take place. During August the Pinnaroo Lines Branches will meet at Lameroo, the Upper Eyre's Peninsula Branches at Cowell (local arrangements in the hands of the Salt Creek Branch), and the Brown's Well Lines Branches at Karoonda. The month of September will be reserved for the Annual Congress, which is usually held in Adelaide during show week. This will be followed by the Hills Branches Conference, to take place at Uraidla, and the Conference of Lower Northern District Branches, to be held at Blyth this year.

No effort will be spared to make these gatherings both attractive and instructive. In the majority of cases comprehensive exhibits of the products of the districts will be displayed, and lectures by expert officers, papers by Bureau members, general discussions, and questions should ensure a good time profitably spent. In accordance with the usual practice, all meetings will be open to the public.

## WEEDS AND SEEDS.

### SEED-TESTING STATION.

England has established a Government seed-testing station. At the formal opening, which took place toward the latter end of last year, the President of the Board of Agriculture, Mr. R. E. Prothero, is reported to have stated that even before the war a good deal of very inferior seed had been on the English market, but during the war that inferiority had increased. Good seed was one of the most essential

requisites of the increased food production which was now so important. It was incumbent on them to provide the farmer with a supply of seed which was pure, and, as far as its germinating power was concerned, of good quality. They must protect him from sowing the weeds which fouled his land, and the parasites which destroyed his growing crop. To do that they must test the seed, and to a certain extent control the supply.

England is by no means the first country to become seized of the importance of seed-testing. Germany took action nearly 50 years ago, and it was largely as a result of the steps taken by that country that others followed her example. The work of the testing stations resulted in the gradual closing of the German retail markets to inferior seeds. Naturally, an outlet for these was sought in other countries, and one after another they were compelled to devise systems of seed control to protect their agriculturists.

Many countries, and amongst these must be included Australia, took no action until numerous weeds were introduced and widely distributed. It is noteworthy that, with two or three exceptions, our worst weeds have been introduced from other countries, and generally through imported seed.

The work of examining commercial seed for weed seed impurities is now looked upon in most countries as inseparable from any effective efforts at weed control, hence the proclaimed noxious weeds of a State or Commonwealth usually come under the scope of seed inspection laws. As an example, in Victoria agricultural seeds cannot legally be sold if they contain more than a certain percentage of weed seeds proclaimed under the State Thistle Act or the Commonwealth Quarantine Act.

Apart from introducing weeds from the other States, there is at present no restriction whatever on the sale or distribution of agricultural seeds containing South Australian noxious weeds, so that while the local authorities on the one hand may try to exterminate them, on the other they are subject to unrestricted distribution by means of commercial seed. Queensland and Victoria exercise legislative control over seeds intended for sowing, so that there appears to be every inducement for those States to send over to South Australia seeds which cannot be legally sold within their own boundaries.

If, to use the words of the President of the Board of Agriculture, England, it was incumbent on them to provide the farmer with a supply of seed which was pure, and, as far as its germinative power was concerned, of good quality, it seems desirable that some action should be taken to ensure that South Australian agriculturists are protected against a possible dumping of inferior seed from other parts. Further, it is little encouragement to the man conscientiously endeavoring to clear his land of noxious weeds to learn that the very weeds which he is attempting to keep under may be distributed by means of commercial seed.



## POULTRY.

### AUTUMN BREEDING.

[By D. F. LAURIE, Government Poultry Expert and Lecturer.]

The writer has for many years consistently advocated autumn hatching. In America, especially in California and the Pacific Coast generally the practice has been adopted during recent years. Breeders are apt to remain in a groove—they may be ultra-conservative. It does not follow that the practices in vogue on the other side of the globe are alone suited to our conditions. Very frequently we have beautiful mild weather in the autumn, and on the other hand we have early hot summers, which are prejudicial to the proper growth of chickens. Late hatching is seldom satisfactory. Individual small lots here and there may turn out all right, but on a large scale this is not so. The weather and temperature are important factors in the growth of chickens. Those hatched in March and April come into the world when the days are shortening and the direct action of the sun is not so intense. Some may argue that it is often as hot in March as it is in December. The warmth is just what very young chickens appreciate, providing they can have access to shade during the heat. As they grow the weather cools down, and by May is generally cold. The ideal conditions appear to obtain, because as the temperature lowers the little birds are strengthening and are better clothed with feathers. The long cool winter is conducive to adequate growth. On the other hand the spring-hatched chickens, especially the late-hatched, are faced with rising and often severe temperatures during the important period of growth. Among our light breeds there is a great tendency to precocity—they mature too quickly, and therefore there is deterioration in size.

The autumn-hatched chickens are well grown and fit for sale in September, at a time when the market is bare of good table birds and prices are high. Even Leghorn cockerels will realize good prices then.

### OBJECTIONS.

It has been stated that the quality of the eggs laid in autumn is different from that of spring-laid eggs. This is pure assumption, for no such difference exists. Green food is abundant on the Murray at all times of the year, and can be grown in numerous localities. Then we hear that the autumn-hatched chickens moult when the spring-hatched do not. At Parafield there are at the moment about 800 odd autumn-hatched pullets, and most of these are like fine hens, and are through their moult. There are also some 2,500 spring-hatched pullets, some of which are through, but all are moulting. As a matter of fact, from the time of hatching until the first adult moult the plumage of the chicken is undergoing changes. Spring-hatched chickens moult at the annual moult, as also others. This has been proved at laying competitions where the leading breeders competed.

Male birds only attend to laying hens or those about to lay. The usual breeding pen consists of six to ten hens and a male bird. If the male bird has been penned alone, and is fresh, he can manage as many hens in autumn as in spring. My advice, therefore, is to hatch light breeds in March and April. Then dismate the pens until the last week in July. Mate up again then, and set eggs for hatching not later than the first week in September. Heavy breeds can be hatched from March until the end of August, but not later.

#### NOTES FOR THE MONTH OF MARCH.

##### STORING EGGS.

An infertile egg will go "bad" through bacterial infection if it is packed in infected material, or is stored amidst insanitary surroundings. Egg shells are porous, and the bacteria which set up decay are microscopic in size and can easily pass through the egg shell pores. During hot weather bacterial action is very rapid. Collect daily twice and market the eggs at least once a week.

##### SCALY LEG.

Apply kerosine 1 olive or cottonseed oil 3 or 4. Rub in well with a piece of rag. At the same time clean the combs and wattles with a very little of the same mixture.

##### CARROTS.

Ordinary garden carrots, chopped finely or pulped, are excellent for occasional use. The carrot is nutritious, and contains valuable mineral salts. Many breeders assert that the regular use of carrots keeps the flock free from worms.

##### GRADE YOUR YARDS.

It is summer now, but wet weather will be here before very long. Repair the poultry yards and fill up all depressions, grade the surface so as to shed the water into a drain. Remove contaminated soil near the gateways and round the houses and replace with fresh soil. See that the floors of all houses are raised well above ground level so as to ensure dry conditions. Now is the time to do all these odd jobs. Where the ground is stiff cover well with sand.

##### BUILDING MATERIAL.

Owing to the scarcity and high price of galvanized iron the use of jarrah and karri sawn palings is becoming general. Owing to the necessity for having covered joints there is some harbor for vermin, but the careful breeder can soon eradicate any that appear. Patent roofing material laid over these palings will last a long time. Adequate accommodation is essential to success.

##### HOLDING BACK EGGS.

Recently it was stated to be a common practice on many farms to hold back the eggs in expectation of a rise in price. The result is that unsound eggs are sent to market. This is a most dishonest and foolish practice. In the interests of the poultry industry and of public health, all readers are earnestly asked to help to put down this practice.

## ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board was held on Wednesday, February 13th, there being present Mr. C. J. Tuckwell (chair), Senator Col. J. Rowell, C.B., Messrs. G. R. Laffer, M.P., A. M. Dawkins, J. Miller, T. H. Williams, F. Coleman, and the Acting Secretary (Mr. H. J. Finnis).

### WHEAT RECEIPTS.

In October, 1917, the Board transmitted to the Minister of Agriculture two resolutions to the effect that agents should be required to give farmers receipts showing the weight of each bag of wheat delivered. At the instance of Mr. Laffer, seconded by Mr. Dawkins, it was decided to again direct the attention of the Minister to the matter, and point out that the Board had not received a reply to its communication.

### ADDITIONAL EXPERT ASSISTANCE.

The Board's suggestion that additional assistance should be provided for the expert staff of the Department of Agriculture was returned with an intimation from the Minister that the financial and other conditions resulting from the war had not only thrown upon the Department a considerable amount of work, which had interfered somewhat with the normal routine of operations, but also rendered it impossible to do anything in the matter of increased staff at present.

### FERTILIZER ACTS.

In the course of his annual report for the year 1916-17, the Director of Agriculture (Professor A. J. Perkins) had stated:—"The Fertilizer Acts deal with substances, the commercial value of which cannot be appreciated by inspection alone, even by experts; hence, for the protection of the public, it has been found necessary to surround fertilizer manufacture and transactions with special precautionary measures. I understand that up to the present time no fertilizer case has yet appeared before our local courts. This may be a tribute to the strict honesty of local manufacturers and dealers, or it may be an indication of the faultiness of the Acts. Certain facts which came under my notice last year lead me to suspect that the present Acts do not afford us all the protection that was anticipated. In view of the seriousness of the position, I feel it my duty to quote the facts. A sample of superphosphate alleged to have been sold as 36/38 per cent. was sent to me by a farmer for analysis. The analysis showed 5.3 per cent. of water soluble phosphate, and 81.3 per cent. of sand. Another sample, also alleged to have been sold as 36/38 per cent. superphosphate, showed on analysis only 20.9 per cent. of water soluble phosphate.

"Unfortunately, in neither case could we take action, largely because of the weakness of the present Acts. It is now necessary to state that the present Acts afford very little protection to users of fertilizers, and that it is imperative that the Acts be amended and modernized, at an

early date. In this direction attention should be called to the following defects in existing legislation:—(1) There is no power to make regulations, subject to periodical revision, defining the constituent parts of fertilizers, and the official manner in which they shall be determined. (2) There is no power to compel that every separate commercial package in which an order for fertilizers is executed shall conform to the guarantee of analysis. (3) There is no power to compel the branding of bags with the analytical data guaranteed to purchasers. (4) There is no power to compel guarantee of fine grinding in fertilizers such as bonedust, which are mechanically ground only. (5) There is no general power to make regulations, which alone can give elasticity to the administration of these Acts. These are a few defects to which attention should be drawn; there is no doubt, however, that for the protection of the public complete remodelling of the Acts is needed, and at the very earliest date."

On the motion of Mr. Laffer, seconded by Col. Rowell, it was decided to recommend that the Acts should be strengthened in the direction suggested by the Director.

#### BUTTER FACTORIES CONFERENCE.

It was decided that the Government should be requested to grant approval for holding a conference of representatives of butter factories on conditions similar to those of last year. A subcommittee, consisting of Messrs. Tuckwell, Shillabeer, and the Secretary, was appointed to undertake arrangements.

#### EUCALYPTUS.

Consideration was given to a proposal made by Mr. H. S. Cope to distil oil from the mallee shoots which were destroyed by farmers in the course of subjugation of the land for wheat-growing. Mr. Cope expressed the opinion that the time was not far distant when certain areas of the poor scrub country would be set apart for the cultivation of eucalyptus, and the production of oils would become a blessing to the struggling pioneers, and a great national industry. "With this object in view," he continued, "I put before you a rough outline, and ask your assistance to interest your department in this subject of great importance to the poor struggler on the land, our maimed returned soldiers, and our mining industries.

"Experience has taught the pioneers that wheat-growing in dry districts is too uncertain for poor men to rely on alone, yet for want of fencing and means to procure sheep they are forced to risk their all on the crop. Speaking from personal experience over the past seven years, there have been more unprofitable crops than profitable, with the result that hundreds of fine, hardy pioneers have been starved off their lands. I contend that if the Government provided portable plants on rental or purchase on terms, and had a couple of good instructors to show the people how to extract the oils, the pioneers would never be driven off the land by crop failure. At present they have to cut the mallee shoots, and they get no returns. If provision were made as above stated, the mallee shoots would return from £1 5s. to £3 odd per acre; in other words, a more profitable crop than the average mallee wheat crop, and not coupled with risks of failure.

"So that you can form some idea why there is so great a difference in values per acre, I will explain by dividing the eucalyptus into three groups, viz., the Phellandrene group, the Eucalyptol group, and the connecting family of these two, the Eucalyptol Phellandrene group. Phellandrene oils are non-medicinal; in other words, are crude turpentine. Eucalyptol, being the medicinal constituent, makes that group the most valuable, although the Phellandrene group generally produces a greater quantity of oil for a given weight of leaf. The Eucalyptol Phellandrene group usually returns a high percentage of Phellandrene and low Eucalyptol. All three groups are mingled with South Australian mallee, and would in most cases have to be distilled together. The medicinal constituents would have to be extracted by refinement. Eucalyptol is used throughout the world in dentistry and hospital work. America is planting thousands of acres of our native tree purely for the distillation of oil, while Australia is burning thousands of tons every year. Phellandrene oil is turpentine (crude), and is used in zinc-lead separation, disinfectants, manufacture of soaps, paints, and varnish, and in many other ways. I know that when I was in the business both Germany and America bought scores of tons every year. The Germans are keenly alive to the value of eucalyptus, while we encourage its waste and destruction.

"If your Department thinks fit to take this matter up I will gladly assist it all I can. If it provides a small plant, and secures me the right to distil, I will undertake to put through trial lots from any district free of charge. If you require further information on this subject, I will be glad to enlist my experience for its success."

The letter was listened to with interest, and a committee, consisting of the Director of Agriculture, Mr. G. R. Laffer, M.P., and the Secretary, was appointed to consider the suggestions made.

#### NEW BRANCH.

Approval was given to the formation of a Branch at O'Loughlin, with the following gentlemen as members:—Messrs. A. Hoffrichter, E. E. Lutz, M. Kloeden, A. Moody, C. Bergman, sen., A. Board, C. Kloeden, A. Kloeden, F. Dahl, S. Trewartha, C. Bergman, jun., E. O. Dahl.

#### LIFE MEMBER.

The name of Mr. A. Moore, of the Gumeracha Branch, was added to the list of life members of the Agricultural Bureau.

#### NEW MEMBERS.

The following names were added to the rolls of existing Branches:—Hartley—William Cross; Coonalpyn—G. E. S. White; Talia—C. T. Dolphin; Naracoorte—R. S. Hannaford, S. Staunton; Nunkeri and Yurgo—T. C. Kelley, I. J. Mitchell; Berri—C. E. Halliday; Cherry Gardens—Herb. Lloyd; Coonawarra—K. Mugford; Frances—L. E. Herold; Meribah—H. H. Gregory; Tantanoola—D. Randall, D. Conside, J. Jordan, W. H. R. Haines, S. Richards, H. Edgcomb, W. Edkins; Glencoe—W. Medhurst, F. Jury.

## DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on March 1st:—

**BUTTER.**—Summer conditions maintained during the month of February—record heat being attained—and with an almost total absence of rain throughout the areas from which cream is forwarded the butter production is in consequence shrinking week by week. Importations of tops from the eastern State have therefore increased, whilst seconds and thirds continue, in smaller quantities, however, to go into cold store for export. At the close of the month "Alfa" realised 1s. 7d.; "Primus," 1s. 6½d. per lb; third grade creamery, 1s. 2d. to 1s. 3d.; choice separators and dairies, 1s. 4d. to 1s. 5d.; fair quality, 1s. 2d. to 1s. 3d.; well-graded store and collectors', 1s. 1d. to 1s. 2½d.; off-conditioned lots, 11d. to 1s. per lb.

**EGGS.**—The seasonable shortening in supplies of eggs occurred about the middle of February, and in sympathy with the improved rates ruling in the eastern States values here firmed considerably, so that now hen eggs are 1s.; duck 1s. 1d. per dozen.

**CHEESE.**—The advance in the market foreshadowed a month ago came about, and although considerable quantities are arriving, yet prices are decidedly firmer. Fair parcels in the 40lb. size are finding their way to the Imperial Government order, and substantial interstate trade as well is being recorded, rates closing at 8d. to 9d. per lb. for large to loaf.

**HONEY.**—The new season's honey is coming along, but only in small lots. Values are firm, prime clear extracted finding ready quitance at up to 5d. per lb.; second grades slow at 3d. to 3½d.; beeswax in good demand at 2s. per lb.

**ALMONDS.**—Export buyers are offering high prices to obtain parcels as it is anticipated the crop this year will be a light one. All forward are finding brisk sale at—Brandis, 1s. 2d.; mixed softshells, 1s. 1d.; hardshells, 8d.; kernels, 2s. to 2s. 1d. per lb.

**BACON.**—A good turnover has been experienced in this line during the month, with values showing a firming tendency. Best factory-cured sides saleable at 10½d. to 11d. per lb.; hams scarce 1s. 3d. to 1s. 4d. per lb. There is no inquiry for farm-cured meat.

**LIVE POULTRY.**—Very substantial quantities were forwarded during the month, but the active demand readily cleared all offering, with prices well maintaining. Heavy-weight table roosters, 3s. 3d. to 4s. 6d. each; nice-conditioned cockerels, 2s. 6d. to 3s. 2d.; plump hens, 2s. to 3s.; light birds, 1s. 6d. to 1s. 9d.; ducks, 1s. 10d. to 3s.; geese, 3s. 3d. to 4s.; pigeons, 5d. to 5½d. each; turkeys from 10d. to 1s. 3d. per lb. live weight for good to prime table birds; fattening sorts, 8d. to 9d. per lb.

**POTATOES AND ONIONS.**—Supplies of early potatoes in the Mount Gambier district have fallen short of expectations, and in consequence the Adelaide market has had to draw mainly upon the Warrnambool district of Victoria. **ONIONS.**—Locally-grown supplies have decreased somewhat during the past month, and the shortage is being made up out of the new crop now being pulled at Mount Gambier. **Quotations.**—Potatoes, £5 10s. to £6 10s. per ton, according to variety on rails Mile End or Port Adelaide. Onions, £7 per ton on rails Mile End or Port Adelaide.

## THE AGRICULTURAL OUTLOOK.

*Boorabowie.*—Weather—During the early portion of the month the weather was hot, and at times rough, windy days with much dust prevailed. The latter half of the month has been cool and pleasant; on February 18th 49 points of rain fell. Crops—All crops are gathered, and the bulk of the wheat has been carted to the railway station. Natural Feed—The dry grass is still plentiful. Stock—Many horses are suffering from digestive troubles. Pests—Rabbits are very numerous. Miscellaneous—The roads are cutting up and dust is inches thick; the scarcity of labor makes it difficult for the councils to keep the roads in repair.

*Turretfield.*—Weather—The early part of February was warm to hot, but during the latter half cool temperatures prevailed, with cloudy skies. The rainfall registered was 41 points, of which 38 points fell on the 18th. Crops—Small plots of lucerne are noticeable throughout the district watered from the Barossa reservoir, and the green fodder obtained from these small plots affords a welcome change of feed for stock. Grapes are getting ready for the pickers. Natural feed, although still plentiful, has lost some of its nutritive qualities, and where it is not supplemented by hand feeding stock are falling off in condition. Pests—Rabbits are becoming more numerous, but as yet do not constitute a pest. Miscellaneous—Stinkwort is very prevalent, and has made big growth. In order to cope with it successfully farmers have resorted to hoeing it up. Owing to the absence of summer rains, no irrigations from the North Para have been possible; but there is still ample water in the river for stock purposes.

*Veitch.*—Weather—The weather for this month has been fine and dry, very suitable for the work to be done in the district at this time of the year. Veitch rain gauge registered 23 points of rain on the 18th and 19th of this month. Crops—All crops are now harvested, and carting operations are nearing a finish. Natural Feed—Dry; stubble feed now the mainstay. Stock—All in healthy condition. Pests—Rabbits are numerous and giving some trouble. Miscellaneous—Good scrub and stubble burns are to be seen on many farms in the district; this will mean a good start for the coming seeding.

### SCABBY FEET IN SHEEP.

The prevalence of scabby feet in sheep was discussed at a recent meeting of the Naracoorte Branch of the Agricultural Bureau. The Chairman (Mr. S. H. Schinkel) mentioned that in his experience animals that were pastured on low-lying land were more likely to be affected than those on rising ground. He mentioned the case of a neighbor who had lost 30 lambs through the complaint. It was seldom that they saw Merino sheep affected; it was generally with Crossbreds that trouble was experienced. Sometimes the scabs extended up as far as the knees. Mr. A. B. Feuerherdt had had most trouble with sheep on low-lying black land. He had never noticed sheep running on scrubby land troubled with scab.

The Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), to whom a number of questions dealing with this matter had been referred, stated that the best treatment to adopt when the numbers to be dealt with were small, was to rub the scabs with damp bluestone, and dab on Stockholm tar; one or two dressings should effect a cure. When large numbers were involved, the animals could be

walked through a race with a floor covering of an inch or two of slacked lime, to which 2 per cent. of bluestone had been added. "The complaint is contagious," he continued, "being due to mange parasites, probably sarcoptic acari or trombidii, though probably arising from ulcerative germs. A microscopical examination is necessary to decide which. Scabby feet and mouths in Naracoorte district are usually caused by the same parasites, but if ulcerative by different ones. The parasites infest pastures, especially scrubby or ferny. Healthy lambs would probably become infected by following affected ones on pastures on which affected animals had been feeding. Change of pasture is good for infected lambs. Scrub or fern country is more harmful than either wet or dry pasture; dry, however, is better than wet. Wherever practicable lime spraying a pasture will clean it up."

### WEEVIL.

There are two weevils affecting wheat in Australia—(1) Rice weevil (*Calandra oryzae*), (2) grain weevil (*Calandra granaria*)—which, on ordinary inspection, are hard to separate. On a careful examination, however, *C. oryzae* is found to have transparent wings under its hard wing-cases, and to have four spots, one on each point of the wing-cases, that are of a decided reddish color, the general color of the insect being a regular dirty brown. With the *C. granaria* it is found to be of a regular dirty brown color without any contrasting spots, and to have the two wing-cases joined together and no wings underneath. This difference in the wings of the two insects means that *C. oryzae* can fly, like most other beetles can, and the *C. granaria* cannot fly, and can only crawl.

The life cycle of both of these weevils is identical, says the Superintendent of Experiments (Mr. W. J. Spafford), and is somewhat as follows:—The female beetle punctures the skin of the grain, making only a very small hole, and in this deposits an egg. This egg hatches as soon as conditions are favorable, and a small, very wrinkly grub emerges, which lives on the materials in the grain for some time, after which it becomes a chrysalis or pupa inside of the hole it has eaten out of the grain. After a few days, if conditions remain favorable, the adult weevil or beetle emerges from the chrysalis, and like the larva or grub, goes on eating the inside of the grain, until most of it is destroyed, or until the call to reproduce itself comes. In the first case it starts on a new grain, in the second it leaves the grain in search of a mate. The cycle of egg, larva, pupa, insect, then starts all over again. In favorable conditions of warmth and moisture, the above cycle takes somewhere about 20 days, and is possibly repeated six or seven times during the season, each batch of eggs consisting of something over 100. Although the cycle takes such a short period, the adult weevils live for a considerable time when the conditions do not suddenly alter, and during the whole period of their life eat the grains amongst which they are living.



## RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of February, 1918, also the average precipitation to the end of February, 1918, and the average annual rainfall.

Station.	For Feb., 1918.	To end Feb., 1918.	Average to end Feb.	Average Annual Rainfall	Station.	For Feb., 1918.	To end Feb., 1918.	Average to end Feb.	Average Annual Rainfall
FAR NORTH AND UPPER NORTH.					LOWER NORTH—continued.				
Oodnadatta .....	—	0.95	1.31	4.76	Spalding .....	0.44	1.83	1.08	20.25
Tarcoola .....	0.93	1.15	0.70	7.58	Gulnare .....	0.19	1.27	0.92	19.74
Marree .....	—	0.95	0.90	6.04	Bundaleer W. Wks.	0.20	2.31	0.95	17.29
Farina .....	0.04	0.40	1.02	6.70	Yacka .....	0.24	0.66	1.00	15.27
Leigh's Creek .....	0.11	0.32	1.09	8.66	Koolunga .....	0.22	0.29	1.18	15.94
Beltana .....	—	0.29	1.43	9.22	Snowtown .....	0.08	0.17	1.01	15.70
Blinman .....	0.14	0.44	1.78	12.83	Brinkworth .....	0.28	1.34	0.88	15.48
Hookina .....	—	0.29	0.52	—	Blyth .....	0.24	0.52	1.19	16.34
Hawker .....	—	0.92	0.95	12.22	Clare .....	0.65	0.75	1.61	24.30
Wilson .....	—	—	1.07	11.78	Mintaro .....	1.06	1.24	1.15	21.99
Gordon .....	0.70	3.37	0.76	10.26	Watervale .....	0.65	0.76	1.55	27.17
Quorn .....	0.22	3.09	0.79	13.78	Auburn .....	0.77	0.88	1.75	24.25
Port Augusta .....	0.24	1.36	0.97	9.46	Hoyleton .....	0.37	0.48	1.20	17.96
Port Augusta W. ..	0.26	1.46	0.82	9.36	Balaklava .....	0.06	0.93	1.14	16.03
Bruce .....	0.10	1.52	0.77	10.01	Port Wakefield ..	0.14	0.18	1.08	13.13
Hammond .....	0.28	1.39	1.03	11.46	Terowie .....	0.10	0.80	1.37	13.71
Wilmington .....	0.20	2.81	1.28	18.26	Yarcowie .....	0.22	1.06	1.22	13.91
Willowie .....	0.09	0.76	0.79	11.90	Hallett .....	0.31	0.64	1.23	16.40
Melrose .....	0.31	2.55	2.00	23.04	Mount Bryan ..	0.24	0.42	1.11	15.73
Booleroo Centre ..	0.03	1.56	1.24	15.83	Burra .....	0.53	0.66	1.40	17.82
Port Germein .....	0.56	1.49	1.06	12.84	Farrell's Flat .....	0.35	0.35	1.33	18.87
Wirrabara .....	0.23	1.37	1.20	18.91	WEST OF MURRAY RANGE.				
Appila .....	0.11	1.15	1.20	15.08	Manoora .....	0.85	0.97	1.01	18.09
Cradock .....	—	0.01	1.10	10.86	Saddleworth .....	0.74	0.90	1.40	19.69
Carrieton .....	0.11	0.85	1.14	12.22	Marrabel .....	0.76	0.95	1.21	18.94
Johnburg .....	0.07	0.91	0.92	10.21	Riverton .....	0.43	0.49	1.29	20.48
Eurelia .....	—	1.21	1.13	13.24	Tarlee .....	0.67	0.73	1.33	17.48
Orroroo .....	0.05	1.33	1.52	13.42	Stockport .....	0.37	0.62	1.25	15.69
Black Rock .....	0.04	1.21	1.18	12.25	Hamley Bridge ..	0.40	0.67	1.32	16.46
Peterborough .....	0.14	0.97	1.25	13.07	Kapunda .....	0.61	0.76	1.51	19.67
Yongala .....	0.31	1.05	0.91	13.94	Freeling .....	0.57	0.82	1.32	17.85
NORTH-EAST.					Greenock .....	0.36	0.65	1.40	21.46
Ucolta .....	0.02	1.60	—	—	Truro .....	0.51	0.70	1.32	19.74
Nackara .....	—	1.85	0.64	—	Stockwell .....	0.63	0.74	1.32	20.30
Yunta .....	—	0.60	1.03	8.22	Nuriootpa .....	0.66	0.84	1.36	21.25
Waukarina .....	0.12	0.95	0.84	7.94	Angaston .....	0.62	0.94	1.37	22.25
Mannahill .....	—	1.41	1.11	8.46	Tanunda .....	0.16	0.36	1.47	22.28
Cockburn .....	—	0.45	1.14	7.97	Lyndoch .....	0.34	0.61	1.31	23.01
Broken Hill, NSW	0.11	1.04	1.42	9.63	Williamstown ..	0.51	0.78	1.48	—
LOWER NORTH.					ADELAIDE PLAINS.				
Port Pirie .....	0.65	1.57	0.97	13.21	Mallala .....	0.21	0.51	1.22	16.88
Port Broughton ..	—	—	1.06	14.33	Roseworthy .....	0.29	0.48	1.23	17.31
Bute .....	0.08	0.15	1.00	15.42	Gawler .....	0.08	0.30	1.37	19.21
Laura .....	0.15	1.24	1.14	18.22	Two Wells .....	0.23	0.29	1.16	16.36
Caltowie .....	0.26	0.95	1.14	17.27	Virginia .....	0.25	0.53	1.20	17.58
Jamestown .....	0.46	0.89	1.19	17.46	Smithfield .....	0.31	0.69	1.05	17.30
Gladstone .....	—	1.15	1.12	16.00	Salisbury .....	0.64	1.08	1.29	18.57
Crystal Brook .....	0.04	0.37	1.14	15.62	North Adelaide ..	0.22	0.73	1.26	21.49
Georgetown .....	0.09	1.08	1.27	18.32	Adelaide .....	0.19	0.57	1.35	21.04
Narridy .....	—	0.29	1.10	16.79	Brighton .....	0.42	0.88	1.18	—
Redhill .....	0.12	0.38	1.07	16.79	Glenelg .....	0.21	0.42	1.12	—
					Magill .....	0.33	0.76	1.48	19.93

## RAINFALL—continued.

Station.	For Feb., 1918.	To end Feb., 1918.	Av'ge. to end Feb.	Av'ge. Annual Rainfall	Station.	For Feb., 1918.	To end Feb., 1918.	Av'ge. to end Feb.	Av'ge. Annual Rainfall
ADELAIDE PLAINS—continued.					WEST OF SPENCER'S GULF—continued.				
Glen Osmond ...	0.40	1.10	1.49	25.26	Talia .....	—	—	0.32	—
Mitcham .....	0.37	1.01	1.34	23.47	Port Elliston ...	0.08	0.08	0.82	16.49
Belair .....	0.68	1.31	1.60	28.64	Port Lincoln ...	0.08	0.12	1.07	19.88
MOUNT LOFTY RANGES.					Tumby Bay .....	0.10	0.43	0.47	15.00
Testree Gully ...	0.57	1.15	1.52	28.19	Carrow .....	0.25	0.27	—	—
Stirling West ...	0.87	2.26	2.41	46.70	Cowell .....	0.36	0.51	0.78	11.76
Ursida .....	0.85	1.75	2.17	44.35	Point Lowly ...	0.06	0.61	1.00	12.21
Clarendon .....	0.45	1.22	1.85	33.67	Cummins .....	0.13	0.42	—	—
Morphett Vale ..	0.30	0.62	1.38	23.32	Arno Bay .....	0.26	0.36	0.60	—
Noarlunga .....	0.27	0.45	1.14	20.28	YORKE'S PENINSULA.				
Willunga .....	0.62	0.70	1.42	25.98	Wallaroo .....	0.16	0.26	1.04	14.05
Aldinga .....	0.35	0.43	1.03	20.34	Kadina .....	0.45	0.47	0.86	15.88
Normanville ...	0.22	0.24	1.11	20.65	Moonta .....	0.13	0.18	0.89	15.22
Yankalilla .....	0.18	0.22	1.07	22.78	Green's Plains ...	0.70	0.70	0.81	15.73
Cape Jervis .....	—	—	0.85	16.34	Maitland .....	0.41	0.60	1.02	20.08
Mount Pleasant .	0.57	0.86	1.51	26.87	Ardrossan .....	0.84	0.94	0.85	13.89
Birdwood .....	0.57	0.92	1.72	29.38	Port Victoria ...	0.05	0.23	0.78	15.21
Gumeracha .....	0.70	1.56	1.79	33.30	Curramulka ...	0.05	0.23	0.92	18.50
Tweedvale .....	0.71	1.30	1.73	35.38	Minlaton .....	0.07	0.30	0.82	17.41
Woodside .....	0.79	1.46	1.76	31.87	Stansbury .....	0.05	0.27	0.93	17.06
Ambleside .....	0.39	1.40	1.77	35.45	Warooka .....	0.05	0.13	0.83	17.71
Naime .....	0.38	0.80	1.80	28.83	Yorketown .....	0.05	0.14	0.82	17.47
Mount Barker ...	0.47	1.23	1.88	30.93	Edithburgh .....	0.07	0.10	0.90	16.48
Echuanga .....	0.57	1.59	1.79	32.83	SOUTH AND SOUTH-EAST.				
Macclesfield ...	0.62	1.23	1.60	30.72	Cape Borda .....	—	0.12	1.19	25.08
Meadows .....	0.58	0.98	1.79	35.52	Kingscote .....	0.12	0.45	0.95	18.95
Strathalbyn ...	0.41	0.52	1.37	19.28	Penneshaw .....	0.09	0.26	1.17	21.34
Myponga .....	0.64	1.17	—	—	Cape Willoughby..	—	—	1.27	19.69
Millbrook Reservt.	1.03	1.79	—	—	Victor Harbor ...	0.53	0.65	1.37	22.18
MURRAY FLATS AND VALLEY.					Port Elliot .....	1.20	1.30	1.31	20.33
Wellington .....	0.24	0.55	1.26	15.01	Goolwa .....	0.47	0.57	1.26	17.93
Milang .....	0.85	1.17	1.16	16.08	Pinnaroo .....	1.00	1.32	1.25	16.74
Langhorne's Bldg	0.17	0.23	0.93	15.27	Parilla .....	0.59	0.76	—	—
Tallem Bend .....	0.23	0.79	0.90	—	Lameroo .....	0.75	0.99	1.13	16.55
Murray Bridge ...	0.35	0.53	1.09	14.32	Parrakie .....	0.28	0.66	0.87	—
Callington .....	0.28	0.66	1.26	15.65	Geranium .....	0.01	0.15	0.97	—
Mannum .....	0.02	0.06	0.92	11.67	Peake .....	0.20	0.46	1.05	—
Palmer .....	0.02	0.09	1.05	15.60	Cooke's Plains ..	0.28	0.54	0.94	14.74
Sedan .....	0.49	0.54	0.95	11.92	Meningie .....	0.61	1.02	1.19	—
Blanchetown ...	0.72	0.72	1.06	—	Coomandook ...	0.47	0.66	0.94	16.80
Eudunda .....	0.35	0.38	1.28	17.33	Coomalpyrn ...	0.28	1.09	1.15	17.49
Sutherlands .....	0.36	0.40	0.71	10.71	Tintinara .....	0.37	0.86	1.08	18.78
Morgan .....	0.12	0.21	0.90	10.60	Keith .....	0.31	0.78	1.09	—
Overland Corner .	0.21	0.21	1.05	—	Bordertown .....	0.43	0.91	1.27	19.76
Renmark .....	0.42	0.80	1.00	11.42	Wolseley .....	0.49	1.21	1.05	17.72
Loxton .....	0.36	0.51	1.00	10.93	Frances .....	0.42	0.95	1.22	20.74
Swan Reach .....	0.24	0.24	0.88	—	Naracoorte .....	0.37	0.73	0.94	22.60
Walkerie .....	0.67	0.75	0.90	—	Penola .....	0.15	0.70	1.84	26.78
WEST OF SPENCER'S GULF.					Lucindale .....	0.08	0.49	1.26	23.32
Eucla .....	2.24	2.39	1.22	19.13	Kingston .....	0.07	0.36	1.33	24.73
White Well .....	0.07	0.07	0.97	9.67	Robe .....	0.08	0.53	1.43	24.69
Fowler's Bay ...	—	0.01	0.88	12.13	Beachport .....	0.09	0.47	1.70	27.51
Penong .....	—	0.02	1.13	11.91	Millicent .....	0.16	0.53	1.88	29.25
Murat Bay .....	—	0.10	0.79	—	Mount Gambier ..	0.48	0.77	2.43	32.00
Smoky Bay .....	—	0.05	—	—	C. Nrthumberland	—	—	1.75	26.63
Streaky Bay .....	0.02	0.02	0.92	15.31	Kalangadoo ....	0.53	1.04	—	—

## AGRICULTURAL BUREAU REPORTS.

## INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page	Dates of Meetings.		Branch.	Report on Page	Dates of Meetings.	
		Mar.	April.			Mar.	April.
Amyton .....	*	—	—	Eurelia .....	*	—	—
Angaston .....	*	—	—	Forster .....	*	—	—
Appila-Yarrowie .....	*	—	—	Frances .....	674	—	—
Arden Vale & Wyacca .....	*	—	—	Freeling .....	*	28	26
Arthurton .....	663	—	—	Gawler River .....	661	25	29
Ashbourne .....	667	25	29	Georgetown .....	*	—	—
Balaklava .....	*	—	—	Geranium .....	*	30	27
Beaufort .....	*	—	—	Gladstone .....	*	—	—
Beetaloo Valley .....	*	—	—	Glencoe .....	*	—	—
Belalie North .....	*	23	20	Glenscope .....	*	—	—
Berri .....	663-7	27	24	Goode .....	*	—	—
Blackheath .....	668	23	20	Green Patch .....	†	—	—
Blackwood .....	668	18	15	Gumeracha .....	*	21	25
Blyth .....	*	—	—	Halidon .....	*	—	—
Bookpurnong East .....	*	—	—	Hartley .....	670	—	—
Booleroo Centre .....	*	22	26	Hawker .....	*	26	23
Borrika .....	*	—	—	Hilltown .....	*	—	—
Bowhill .....	*	—	—	Hookina .....	*	26	23
Brentwood .....	661	28	25	Inman Valley .....	*	—	—
Brinkley .....	*	—	—	Ironbank .....	*	—	—
Bundaleer Springs .....	*	—	—	Julia .....	*	—	—
Burra .....	*	—	—	Kadina .....	*	—	—
Bute .....	*	—	—	Kalangadoo .....	674	9	13
Butler .....	*	—	—	Kanmantoo .....	671	23	20
Caltowie .....	*	—	—	Keith .....	*	—	—
Canowie Belt .....	*	—	—	Ki Ki .....	*	—	—
Carrieton .....	*	—	—	Kingscote .....	*	—	—
Carrow .....	*	—	—	Kingston-on-Murray .....	*	—	—
Cherry Gardens .....	*	26	23	Kongorong .....	*	26	23
Clanfield .....	*	—	—	Koonibba .....	663	26	23
Clare .....	*	—	—	Koppio .....	663	5	2
Clarendon .....	671	—	—	Kybybolite .....	672	21	19
Claypan Bore .....	*	—	—	Lameroo .....	*	—	—
Colton .....	*	—	—	Laura .....	*	22	19
Coomandook .....	*	—	—	Leighton .....	*	—	—
Coomooroo .....	*	—	—	Lenswood and Forest Range .....	*	—	—
Coonalpyn .....	*	29	—	Lone Pine .....	661	—	—
Coonawarra .....	671	—	—	Longwood .....	670	—	—
Coorabie .....	*	—	—	Loxton .....	*	—	—
Cradock .....	*	—	—	Lucindale .....	672	—	20
Crystal Brook .....	661	—	—	Lyndoch .....	661	—	—
Cummins .....	*	30	27	MacGillivray .....	*	—	—
Cygnet River .....	669	28	25	Maitland .....	663	—	—
Davenport .....	*	—	—	Mallala .....	*	11	8
Dawson .....	*	—	—	Mangalo .....	*	—	—
Denial Bay .....	*	—	—	Mantung .....	*	—	—
Dowlingville .....	*	—	—	Meadows .....	670	26	23
Edillilie .....	663	26	—	Meningie .....	*	—	—
Elbow Hill .....	*	—	—				

## INDEX TO AGRICULTURAL BUREAU REPORTS—continued.

Branch	Report on Page	Dates of Meetings.		Branch	Report on Page	Dates of Meetings.	
		Mar.	April.			Mar.	April.
Meribah .....	666	—	—	Port Elliot .....	*	16	20
Milang .....	670	9	13	Port Geomein .....	*	—	—
Millicent .....	*	12	9	Port Pirie .....	*	23	20
Miltalie .....	*	23	20	Quorn .....	660	23	20
Mindarie .....	*	4	1	Rameo .....	666	—	—
Minlaton .....	*	22	26	Redhill .....	*	—	—
Minnipa .....	*	—	—	Renmark .....	*	—	—
Mintaro .....	*	23	20	Riverton .....	*	—	—
Mitchell .....	*	—	—	Riverton (Ladies') ..	*	—	—
Monarto South .....	667	—	—	Roberts and Verran ..	*	—	—
Moonta .....	*	—	—	Rosedale .....	*	—	—
Moorlands .....	*	—	—	Rosy Pine .....	*	—	—
Moorchard .....	660	23	27	Saddlesworth .....	*	23	20
Morgan .....	*	—	—	Salisbury .....	*	—	—
Morphett Vale .....	*	—	—	Salt Creek .....	663	—	—
Mount Barker .....	671	27	24	Sandalwood .....	*	—	—
Mount Bryan .....	*	—	—	Sherlock .....	*	—	—
Mount Bryan East ..	*	—	—	Spalding .....	*	—	—
Mount Compass .....	*	—	—	Stockport .....	*	—	—
Mount Gambier .....	*	9	13	Strathalbyn .....	*	26	23
Mount Hope .....	*	23	20	Sutherlands .....	*	—	—
Mount Pleasant .....	*	—	—	Talia .....	*	9	13
Mount Remarkable ..	*	20	17	Tantanoola .....	*	2	6
Mundalla .....	*	27	24	Tarcowie .....	*	26	23
Mundoorra .....	†	—	—	Tatiana .....	*	2	6
Murray Bridge .....	*	—	23	Tintinara .....	*	—	—
Myponga .....	667	—	—	Two Wells .....	*	—	—
Myrta .....	*	—	—	Uraidla and Summert'n	*	—	1
Nantawarra .....	*	—	—	Waikerie .....	†	—	—
Naracoorte .....	673	—	—	Warcowie .....	*	—	—
Narridy .....	*	—	—	Warrow .....	*	—	—
Narrung .....	*	—	—	Watervale .....	*	—	—
Netherton .....	*	—	—	Wepowie .....	*	23	20
North Bueborowie ..	*	—	—	Whyte-Yarcowie .....	*	18	16
North Bundaleer .....	*	—	—	Wilkawatt .....	*	—	—
Northfield .....	*	5	2	Willowie .....	*	26	23
Nunkeri and Yurgo ..	666	—	—	Wilmington .....	*	—	—
O'Loughlin .....	*	—	—	Wirrabara .....	660	—	—
Orroroo .....	*	—	—	Wirrega .....	*	—	—
Parilla .....	*	—	—	Wolowa .....	*	—	—
Parilla Well .....	*	—	—	Woodleigh .....	*	—	—
Parrakie .....	*	—	—	Woodside .....	*	—	—
Paskeville .....	*	—	—	Wynarka .....	*	—	—
Penola .....	*	—	—	Yabmana .....	*	—	—
Penong .....	*	9	13	Yaaka .....	*	—	—
Petina .....	*	—	—	Yadnarie .....	*	—	—
Pine Forest .....	*	—	—	Yallunda .....	*	—	—
Pinnaroo .....	*	—	—	Yaninee .....	663	—	—
Pompoota .....	667	6, 20	3, 17	Yeelanna .....	663	—	—
Port Broughton .....	*	—	—	Yongala Vale .....	*	22	19
				Yorketown .....	*	—	—

\* No report received during the month of February.

† Formal report only received.

‡ Held over until next month.

## THE AGRICULTURAL BUREAU.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

### REPORTS OF BUREAU MEETINGS.

#### UPPER-NORTH DISTRICT.

##### (PETERSBURG AND NORTHWARD)

MORCHARD (Average annual rainfall, 11in. to 12in.).

January 26th.—Present: 15 members and two visitors.

WOOL AND SHEEP VERSUS WHEAT-GROWING.—Mr. C. J. Case, in a paper under this heading, said that on any average-sized farm in that district one could keep 500 to 600 sheep. One hundred well-bred ewes should be kept to maintain the standard of the flock. The chief expense in keeping sheep was the cost of shearing and the purchase of wool bales, &c. In growing wheat it was necessary to have a good plant of stock and implements, and the expense and upkeep attached to them generally amounted to a fair sum each 12 months. In the discussion that followed Mr. B. S. McCallum said wool and lambs were most profitable, and suggested that by combining sheep with wheat-growing the farmer would get along much better. Other members spoke, and the general opinion was that one should combine sheep with wheat-growing.

QUORN, February 22nd.—A discussion took place on the subject of "Noxious Weeds," and on the prevalence of smut in the crops of the northern districts.

#### MIDDLE-NORTH DISTRICT.

##### (PETERSBURG TO FARRELL'S FLAT.)

WIRRABARA (Average annual rainfall 18.91in.).

February 23rd.—Present: 15 members.

LUCERNE-GROWING.—Mr. R. P. Hoskins, in a paper on this topic, said lucerne would be found to thrive best on deep, coarse, and loose soil. Once properly established it was one of the hardest of fodder plants, and would last quite a number of years without resowing. The land should be well manured, ploughed with the first rains, then harrowed down, and receive another dressing of manure before seeding. Sowing should be commenced preferably during August, provided the weather was not too frosty. Should weeds appear every effort should be made to destroy them or they would choke the young lucerne plants. Lucerne should not be watered during the early stages of its growth, because being a summer plant its roots should be encouraged to strike downwards. Ample provision should be made to ensure a good supply of water. That fact should be thoroughly realized if one reckoned on cutting the crop, say, four or five times during the year, and giving the lucerne a good soaking after each cut. No hard-and-fast rule could be laid down as to what was the correct time to cut the crop. Many growers agreed that when the plants commenced flowering was the most profitable period. Again, when the crop had come to a standstill through lack of moisture it was deemed advisable to cut it. When new growth showed itself at the bottom of the old plants the crop should also be cut. The most economical time to water the crop was when the sun's rays did not strike directly upon it, or else during a cloudy day.

CRYSTAL BROOK, January 26th.—The noxious weeds question was discussed at length, and Mr. E. Heaslip (Secretary of Experimental Plots Committee) tendered a report for the past 12 months.

## LOWER-NORTH DISTRICT. (ADELAIDE TO FARRELL'S FLAT)

### LONE PINE.

February 19th.—Present: 24 members and three visitors.

**MAINTENANCE OF ROADS.**—In a short paper dealing with the question of maintenance of roads Mr. A. T. Lehmann said that in order to secure suitable metal good ironstone should be selected and broken down to a size of 2½ in. Before the metal was spread all holes should be thoroughly cleaned out. If the holes were very deep a few large stones should first of all be used, as that would make a more solid foundation. It was advisable to have a crown of about 4 in. on a 14 ft. road to prevent the water from standing on it. Rolling should then be commenced, followed by a good thick blinding. If convenient the work should only be undertaken during wet weather, and no traffic should be allowed on the road until the rolling was finished.

**GAWLER RIVER, January 28th.**—The meeting took the form of a discussion on the subject of "Noxious Weeds."

**LYNDOCH, February 21st.**—Mr. Moore initiated a discussion on the "Olive as a Hedge or Breakwind Around An Orchard." Some members thought the olive too slow of growth, others favored *Pinus insignis* and the carob. Mr. E. Filsell tabled two bunches of grapes from 200 vines planted as Frontignac. Members thought one bunch had Frontignac flavor, but Zante peculiarities otherwise. The other bunch had white berries as well as black.

## YORKE PENINSULA DISTRICT. (TO BUTE.)

### BRENTWOOD.

November 29th.—Present: 13 members and visitors.

**HARVESTER VERSUS STRIPPER AND MOTOR WINNOWER.**—The method of harvesting one's crop, said Mr. R. G. Anderson, in a paper dealing with the merits of the harvester and the stripper and motor winnower, depended to a large extent on the circumstances in which the farmer was placed. Where the soil was heavy, and would stand much cultivating, and where labor was both scarce and expensive, he advocated the harvester, as it was much quicker and more economical in handling the crop. But in a district where the soil was of a sandy or very light nature the stripper would in all probability be the most profitable, as it was lighter running and had fewer wearing parts to become cut out with sand, neither would it make the land dirty by distributing weed seed. In dealing with the merits of the stripper the most important feature about that implement was the saving of chaff, which, if cared for, could be put to very good use in feeding sheep and young stock. Then again, one should not overlook the fact that a stripper could be worked with fewer horses, and worked on cool days, when a harvester would not make a good sample. In that case a farmer would be able to reap the crop off into heaps a few days earlier than if the harvester was employed. The harvester was also capable of saving the chaff by means of a chaff carrier which could be fitted to it. A harvester of necessity took more horses to work it, as there was much more machinery to drive than an ordinary stripper, but as a rule a farmer who had enough horses to put the crop in should also have enough and to spare to work a harvester. He was also of the opinion that if it was a fit day to work a stripper a harvester could also be worked, and even if it did not make a first-class sample, that portion could be run through a winnower and a first-class sample secured. Another important

feature was that when a crop had been harvested into bags the farmer was able to sew up same during mornings that were too damp or cool to reap, so that if there were days when the farmer was not able to reap he would probably be able to cart the grain to the merchants and thereby save much weight, which would be lost if the wheat were left in the paddock in heaps to be spoiled by rain. If a heavy rain should fall, which was not unusual, grain in bags could be more easily attended to than if left in heaps. It could be stood out on dunnage, and would soon dry if in sacks, whereas a heap must necessarily be turned over two or three times if it became wet. That meant much labor, besides the damage done to grain on the ground, which he considered amounted to more than that which was lost off the sieves of the harvester. Economy was another item that should not be overlooked, for instance a farmer who was single-handed and put in approximately 300 acres of crop, should consider which was the most economical—to strip the crop with the stripper, and employ labor to help handle it after it was stripped; or to do the work himself and reap with a harvester. The following figures showed the approximate cost of purchasing a stripper and motor winnower:—Stripper, £70; and motor winnower, £235; total £305. It would then be necessary to employ two, if not three, men to help, which meant at least another £10, so that the cost of implements and labor for the first year was approximately £315. With the cost of upkeep at £5 per year, petrol included, and cost of labor £10 per year, in five years the implements, wages, upkeep, &c., would amount to £380; whereas if a harvester were used the cost would be about £120, and the upkeep would not be more than that of the stripper and winnower, so that in five years the plant would only cost about £145. Surmising that the 300 acres yielded 1,200 bags, an average of four bags per acre, the farmer would then have to wait until he was able to secure the services of someone with a winnower, and by the time he had boarded them and found the extra man, which was the general rule, besides his own labor, it would cost at least sixpence per bag. That would amount to £30 per year, and if taken over a term of five years, with the cost of stripper added, it would total £220. He concluded that the harvester was much more economic than the stripper, besides being the better implement for a farmer who had to work single-handed. In the discussion that followed Mr. H. L. Martin considered the cost of the motor-winnower as stated in the paper to be excessive. Then again, if a harvester was used an engine was usually kept as well for chaffcutting. He thought if that cost were added to the harvester it would be higher than the stripper and motor winnower. Usually the owner of the motor winnower was able to pay more than the cost of his own cleaning by cleaning for other farmers. In regard to the labor difficulty, only a man or two was required for an additional week or so. Mr. F. Nation thought that in the future both harvester and stripper would be superseded by binding and threshing machines. He considered at present where there was only one man on a farm that the harvester was best. Mr. C. Boundy preferred the stripper, that district being so well adapted for barley growing. An earlier start was possible, and a better sample resulted. The use of the harvester in rough country usually resulted in a bad sample. Mr. A. Babbage agreed with the writer of the paper in advocating the harvester. He was certain a good sample could be made by the harvester, although perhaps fewer of the light grains would be blown out. He contrasted the hard work attached to motor winnowing with that of the much easier work of the harvester. He considered it better to get the crop off quickly and away out of danger. Mr. H. Launer favored the stripper, especially for small paddocks. It did not take long to clean up with the motor winnower, and a splendid sample resulted. Mr. W. Alderman favored the harvester for a good clean crop, and fairly even land, but otherwise the stripper. He considered that there was no waste by either if worked by competent men. Mr. C. Newbold, although agreeing that good work could be done in clean crops by harvesters, especially the latest models, yet considered that taking one year with another the stripper and motor winnower were the best. He very strongly advocated the working of a motor winnower on a co-operative basis, and the expense would be found to be small. He cited a case in proof of the wasting of grain by the harvester. In regard to reaping not much longer time was taken in emptying a stripper than a harvester and there was another important difference between the two, that whereas anybody who was able to drive could work a stripper, with a harvester only a competent person could handle it without waste resulting. He also thought there was more danger of destruction by fire through having the bags spread all over the place. He again strongly advised co-operation among the farmers.

ARTHURTON, February 14th.—The subject of sheep-dipping was introduced by Mr. Colliver, and a good discussion took place.

MAITLAND, February 2nd.—The meeting took the form of a discussion on the subject of "Noxious Weeds."

## WESTERN DISTRICT

KOPPIO (Average annual rainfall, 22.40in.).

January 28th.—Present: 12 members and one visitor.

A discussion on the topic of "Noxious Weeds" took place. Mr. W. Jericho tabled a fine sheaf of maize sown in August, which showed splendid growth, and was about 4ft. high. He also tabled some very fine bunches of Zante currants, peaches, and nectarines. A remarkable difference was noticed in currants from trellised vines and those not trellised. The latter were poor, open bunches, while the trellised vines were loaded with large, even bunches. All the vines had been ring-barked.

## SALT CREEK.

February 23rd.—Present: seven members and one visitor.

PLOUGHING FIRE BREAKS.—Mr. W. A. Fraser contributed a short paper dealing with this question, which was read by the Chairman (Mr. C. Venning). The practice of ploughing fire breaks around the wheat fields he said, was one that was very often neglected on many farms. It was his intention to plough around the crops at seeding time. The usual method of ploughing close up to the fence could still be carried out, but when seeding was commenced it was a good plan to start the drill in, say, about 30ft. from the fence, thus leaving a very good plough mark and safeguard against any early outbreak of fire. If that method were adopted he felt sure much time would be saved. In the discussion members generally agreed with the main features of the paper. Mr. W. Gale thought it was a good plan to have a fire break prepared beforehand. Mr. A. Venning suggested using a scarifier along the fences. The Chairman thought mallee leaves were the worst enemy in letting fire cross breaks, and that a binder cut around a crop would form a good break.

EDILLILIE, February 23rd.—The meeting discussed the subject of the prices of super.

KOONIBBA, January 24th.—The evening was devoted to a discussion on the subject of "Noxious Weeds."

YANINEE, January 26th.—"General Blacksmithing" was the title of a paper read by Mr. G. Parker. The paper was very instructive, and was well discussed by members.

YEELANNA, January 19th.—A short paper on the subject of "Hay-cutting" was contributed by Mr. J. F. Kammerman. He said all snags should be cut level with the ground, and loose stumps picked up. It was a good plan to run a heavy roller over the ground, as that would enable the binder to do a much better job. He favored tying large sheaves, as there would be a considerable saving of twine, and would also make carting and stacking easier. If the hay was left in the paddock for any length of time, large round stooks should be made.

## EASTERN DISTRICT.

### EAST OF MOUNT LOFTY RANGES)

## BERRI.

February 20th.

CULTIVATION.—In the course of a paper on the subject of "Cultivation" the following remarks were expressed by Mr. Ray Moss:—"Cultivation is an item to which horticulturist and agriculturist cannot pay too much attention. In our district orchard work occupies our time and interests, so it is from a horticulturist's point of view that this paper is written. In districts that rely on the rainfall to mature



fruit, and to successfully develop fruiting wood for the next season, cultivation is an absolute necessity or the returns will be nil. In the Murray settlements where an abundance of water is available, an orchard or vineyard can be kept alive, and a small quantity of fruit harvested with scant attention to cultivation. This fact I am afraid is the downfall of many would-be irrigationists. Even if we have an abundance of water the best cannot be made of it unless we also thoroughly cultivate the land. Cultivation to a certain extent does away with the danger of salt and seepage. In most cases the cause of salt on the surface of the land is that the salt is forced out of the subsoil towards the surface by excessive water in the subsoil, and rapid evaporation on the surface through lack of cultivation. Seepage in some cases is also caused through lack of cultivation. The irrigationist finds his land becomes very dry before the next watering is due, and his remedy is to pour 6 in. to 14 in. of water per acre on to his land. The land will accept this amount of water for a little while, and the trees or vines respond by making vigorous growth, but if this method is stuck to the result to himself, and sometimes to his neighbor, is disastrous. Extra work put into cultivation from the beginning means less worry and work later on. There is cultivation and cultivation. We have in our settlement different classes of land—heavy, blue, alluvial (such as is found on the Murray Flats) sandy loam, and sandy soils, which are found on our highlands. In some cases the soil is very shallow, limestone or clay being close to the surface. It is impossible to work this class of land very deep, but in all other classes of soil the deeper it is worked the better. It is not a bit of use turning over two or three inches of soil with the plough and then cultivating over at the same depth. It is better than nothing, but if we can get better results still, why not have them—it does not mean much more work; a little heavier on your horses, and perhaps a little slower through having to use a furrow less on your plough, but it pays. Land such as we have on our flats—heavy blue land—needs different treatment from that required by our higher lands, both as regards cultivation and irrigation. Owing to the ground being heavy and compacted, it will not take the water in as rapidly as the more sandy soil. Therefore the heavy lands have to be flooded before sufficient water reaches the subsoil to tide the plant and fruit over the period between the irrigations. All these so-called heavy flats do not require heavy floodings, as they are only leaching out the properties of plant life, which have to be kept up by applications of manure, otherwise your property will deteriorate. This class of land benefits greatly by gypsum, a cover crop ploughed in, and cultivation. It is essential to have two of these—gypsum and cultivation. The cover crop you can do without, but at the same time I recommend anybody to plant peas on any of our land and plough them in, both for improvement of heavy soils and as a fertilizer. When first this land is ploughed it is very stiff, but you will notice with constant cultivation the soil becomes more friable, so keep the cultivator moving; then apply a good dressing of gypsum, and the land becomes much more easy to work, and takes the water in more readily. Having a finer tilth on the surface the loss by evaporation is much less, therefore your land does not need the heavy floodings you had been giving it previously. You will find that land that has been flooded dries out more quickly than land watered in furrows. This is very noticeable on our high lands. There are times when the bottom ends of your rows become flooded, and even though it has a greater quantity of water there than a little further up the row, you will find the flooded portion dry out more quickly than the other. The reason for this is the land is set hard with the flooding, and the capillary attraction is therefore greater. The end of the row receives the same cultivation as higher up the rows, and where the capillarity is checked higher up the row by the surface being thoroughly broken up, the evaporation is still going on on the flooded area, because of the land not being finely worked up. This, I think, shows that where the system of flooding the land is practised, thorough cultivation is needed. Another period at which cultivation should be absolutely thorough is after a heavy rain. The rain beating on the surface of the soil compacts the surface, therefore opening the pores of soil over the whole of the surface, and unless the surface is broken up the evaporation is very great, allowing the rain and what other moisture there is, to escape into the air where your vines and trees cannot make very much use of it. When and how the land should be cultivated.—I will start with the month of April. In this month crops that are to be used for ploughing in for manure should, if possible, be sown. It is the practice on the Murray Flats to flood the land, and immediately it is possible cultivate and sow it while it is still moist. Those on the higher land are at a disadvantage because there is

danger of seepage. If the land is soaked sufficiently to germinate any seed that is sown therefore a rain is relied on to moisten the soil. If you are unable to get your crop in before the end of May, I advise not to put it in at all, because there is not then time to get sufficient growth to plough in before the land should be ploughed. The best crop to sow for ploughing in is field peas alone, peas and barley, or peas and oats. I prefer the last, sown with 1cwt. to 2cwt. of superphosphate. If no crop is sown the first ploughing should commence in May, and the ploughing should be left in its rough state, allowing the air and frosts to act on the soil, thereby sweetening the land and helping to bring into life the soil properties. This ploughing should be at least 6in. or 7in. deep, and if your soil is very deep 8in. will be all the better. If this depth can be obtained with a double-furrow plough by all means use it, but if not do not skimp your work for the sake of a little extra time. Two good horses in a single-furrow plough will plough 8in. deep, on heavy land. These horses may be needed, if they are, use them. After this ploughing a short period can elapse, and your pruning can be done. Your next ploughing should be done in July, when your cover crops, if you have sown any, should be ready. A disk coultter attached to a single-furrow plough with a good big mould board will be found to do excellent work. A chain to drag in the crop is of no use with peas, but with straight-growing crops the chain will be of assistance. With trellised vines it is impossible to cross plough, and it is here that the syracuse hoe is found, after once being used, to be indispensable for cutting out the weeds from under the trellis. After ploughing and syracuseing your vines the harrowings should be run over the land to break up the surface, and then the disk set to throw against the vines to fill in the furrow made by the hoe. For that purpose, and making banks are the only occasions that I recommend the use of a disk as a cultivator, for unless immediately followed by a tine cultivator, working deeper than the disk, it is impossible to get on the land at the right time. The disks scratching along under the surface also form a hard pan, which allows evaporation to take place. If a cultivator is followed behind the disk this hard crust is broken up. In the case of ploughing amongst trees the first ploughing should be across the direction of watering. The next ploughing should be across the previous one. The syracuse hoe will also be found of benefit amongst the trees, saving a lot of hard labor by cutting the weeds from under the trees. But these same hoes require tynes fixed on them to cultivate the land under the trees, after the hoe has been over it. It is immaterial in our district which way you throw your land with the plough, to or from the tree. The best plan is to plough from one season, and to the tree next season, to avoid getting banks against the tree, or in the middle of the row. Ploughing should be done if possible after a rain while the soil is still moist. It will then be found in most cases to turn off the mould board well, and bury any rubbish effectively. After the ploughing is completed the whole of it should be cross harrowed, and then allowed to rest until the weeds or crop have thoroughly rotted. Then the land is ready to be cultivated. A tyne cultivator which takes not less than two horses to pull it, should be run over the land, not too deeply the first time, say about half the depth of the ploughing. This will leave the surface in good order for the next cultivation, which should follow immediately, and the cultivator set as deep as the horses will pull it. If you cannot get deep enough with two horses, put swings on for three. The greater the depth the soil is broken up and the finer it is worked the greater the check on evaporation. If there is only 2in. or 3in. of worked land, a hard crust quickly forms under this, and allows evaporation to take place, but if you have a mulch of 6in. to 8in. of finely-worked soil, it will be found that this land will be able to hold the moisture. After this second cultivation the land can be harrowed, and if all this work has been done up to time the soil should be in good condition and free of weeds, but a lot of us have more on our hands than we can manage, and the cultivating is sometimes left too late with the result that the weeds get ahead of us in the spring time. Instead of trying to cultivate these out the best plan is to plough the land again with a two or three-furrow plough. As long as your winter ploughing was done deeply this ploughing need only be deep enough to kill the weeds, but I recommend after a day's ploughing done in the summer months, to run the harrows over it immediately, and then a minimum amount of moisture is lost. The cultivation for the summer time is to work the soil after every irrigation as soon as the land is dry enough to get on, and after every heavy rain. If you have a light rain just previous to an irrigation it is not necessary to cultivate, but if it comes just after you have cultivated this moisture can be conserved by running over the land

with the harrows. Between irrigations, even if there is no rain, a cultivation is of benefit, loosening up any land that may have become trampled down in some way, and to keep down all weeds, which grow luxuriantly under irrigation. Keep the land cultivated right through the summer even after the crop is off, as you have to study your next season's fruiting wood, and if the vitality is kept up in this, you are going to get a much better crop than if the fruiting wood becomes checked in its growth. Sometimes there are cases where your trees and vines are making too much wood. This can be checked by easing off the cultivation. During the winter ploughing you will probably have noticed the land turn up lumpy where you have been in the habit of running the furrows down the rows for irrigation. This is caused by the cultivator not touching the bottom of the irrigation furrow, which probably has, and rightly so, been made deeply; the water running along the bottom of the furrow forms a crust, which, unless torn up, becomes dry and sets like a brick. This, of course, is allowing evaporation to take place. The bottom of this furrow should by some means be broken up at least twice a year, after the December and January irrigations being the best time. The bottom of this furrow can be reached with the seuffer, but the best way I have found of breaking it up is to run along the furrow with two horses in the subsoil plough. It may take a little time, but it will pay you. Just in conclusion, the main points to remember in cultivation are plough deeply and at the right time, cultivate deeply and often, with the right implement, and keep down all weeds which harbor Rutherglen fly, &c., and take out moisture which the tree can do with.

#### MERIBAH.

February 15th.—Present: nine members and six visitors.

BEST VARIETY OF WHEAT FOR DISTRICT.—In the course of a short paper under this heading, Mr. H. T. Dart spoke in favor of Red Russian. He said it was a good heavy yielder, and the straw being sweet it was well liked by stock. It was not affected to any great extent by rust, and stood up well during rough weather. Speaking of the early varieties, he considered Ghayas to be one of the best. Generally members agreed with the opinions expressed in the paper. Mr. A. G. Petch, however, mentioned a preference for Yandilla King and King's Early; and Mr. W. T. Young, Nhill.

#### NUNKERI AND YURGO.

February 3rd.—Present: 12 members and visitors.

STORAGE OF GRAIN ON THE FARM.—Mr. F. F. Welford, who contributed a paper under this heading, said the waste caused by mice and weather would easily repay the expense of erecting a silo for the storage of grain. The silos could be built of stone, with a concrete floor, and roofed with either galvanized iron, malthoid, or wooden pickets tarred and sanded. Another method was to build the silo with concrete blocks. Another plan, and one which the average farmer could easily adopt, was to erect the silo by the use of lime concrete between boards. That method required no skilled labor, and rough surface stone could be used. Yet another method was to put up a frame work of jarrah on concrete or stone pillars, on account of white ants, and then sheet in with tarred and sanded jarrah palings.

#### RAMCO.

December 17th.—Present: 11 members.

BEST METHOD TO TREAT SMALL MALLEE AND PORCUPINE LAND.—A discussion on this question was initiated by Mr. E. J. Burton. The practice he would adopt would be to clear the land and burn during either February or March, then fallow during the same year. It was advisable to plough fairly heavily the first year, as that would root up a great many of the stumps. Porcupine would readily burn, and as it only came up after the wheat had ripened, it could be burnt off with the stubble. Very little mallee would grow after three years, provided one cut the shoots regularly each winter. A stump-jump plough with large shares would be found to successfully cope with most porcupines. In concluding, he gave preference to Federation as the best wheat for that district.

BERRI, December 26th.—The subject of "Fruit-drying" was introduced by the Hon. Secretary (Mr. W. R. Lewis), and a good discussion followed.

MONARTO SOUTH, January 26th.—The meeting took the form of a harvest report, when 26 samples of wheat were brought in, showing an average of a shade under 61lbs. to the bushel.

MYPOLONGA, November 22nd.—The Superintendent of Experimental Work (Mr. W. J. Spafford) delivered an address on "Fodder Crops on Reclaimed Swamp Lands." At a meeting held on December 4th the Government Veterinary Lecturer (Mr. F. E. Place) addressed the members on the subject of "Pigs and their Ailments."

POMPOOTA, February 6th.—The Dairy Expert (Mr. P. H. Suter) visited the Branch and delivered a lecture on "Dairying." The lecture was illustrated by lantern slides.

## SOUTH AND HILLS DISTRICT.

### ASHBOURNE.

January 28th.—Present: 17 members and one visitor.

DAIRYING.—"To be a successful dairyman," said Mr. Ken. Kirkham, in a paper under the heading of "Dairying," one should pay close attention to the following points:—Selection of herd, culling, locality, quietness in handling, cleanliness, and feed and general management. In selecting the herd, if one had no previous experience in dealing with cows, it was advisable to obtain the opinion of some capable judge of dairying stock. It was on the first cows of the herd that so much depended, namely, the class of stock that the herd would eventually consist of, and the profit that would be derived from the cattle. The cow best suited for dairying work, and one which from experience he favored, was one at about second or third calf, fine bone, sharp features, wide across the bridge at back below the tail, good esutecheon, narrow in fore quarters, and deep in back, good deep, wide udder, well up under the belly and as near square as possible, with teats set well apart and about 3in. or 4in. long. He favored the Jersey Shorthorn cross. All duffers should be culled, as they would consume just as much feed as a good cow. Of course everything depended on whether one was a milk vendor or butter maker. A point often neglected in so-called 'good dairymen' was the quietness in handling. It was frequently heard that a cow was sulky, or again another cow would not give her milk down. The cow had no control whatever over her milk flow. The nervous system, the digestive system, and the milk system all worked in co-operation with one another. Thus it should be readily understood that if one system was upset how easily the others would be affected. The speaker pointed out that he was speaking only in regard to the production of butter fat, and that in dealing with the question of food, upon which there was so much controversy, he had come to the conclusion after 15 years' experience with dairying stock that lucerne was easily the best fodder for dairying cattle. Although it was not practicable to grow lucerne on every farm, he considered that as a fodder it was very much neglected. If the former points were observed, and a general working system adopted, the management of the dairy would be much easier. The following few points should be kept in mind:—Always endeavor to milk the cows at regular hours, weigh the milk, because that was a check on the firm who made the cream into butter. He had found it a good plan to put a bucket of hot water into the milk before commencing to separate, to bring the temperature up to as near 103deg. as possible. Especially should that be done if there was a long interval between milking and separating. The speed of the separator should also be tested to prevent any waste of cream. A cool dairy should be made in which to keep the cream cool and free from dust, dirt, &c. The cream should be kept in a can with a large cooling surface, and stirred as many times as possible. He advocated the full-handed style of milking, with clean hands, and would strip the teats thoroughly.

## BLACKHEATH.

January 36th.—Present: 11 members and two visitors.

**CULTIVATION OF VEGETABLES.**—Mr. J. Pym, in a paper under this title, said as vegetables were easily grown in that district every homestead should have a small vegetable garden. Three factors were essential for the successful growing of vegetables, namely, manure, moisture, and good cultivation of the soil. For the potato the land should be deeply worked, and a good dressing of manure applied. When the plants were well above ground the land should be kept well stirred to keep it free from weeds, and also to prevent a hard crust from forming on the surface. He did not think it advisable to use cut seed in either very wet or very dry land. Onions, peas, beans, parsnips, carrots, cabbage, cauliflower, cucumber, and tomatoes would do well in that district if suitable spots for them were chosen. The best results were obtained from farm manure that had been previously worked into the land, and then redug at the time of planting. Where it could be avoided, fresh, unrotted manure should not be put under vegetables at the time of planting. Cabbages and cauliflowers needed a very heavy dressing of manure to force them on quickly. Nearly all vegetables would grow on a lighter dressing of manure in summer than in winter months, because of the natural warmth in the ground. In winter artificial heat had to be created by the use of manures. Where artificial manures were used under fine seed and tender plants great care should be taken or the germ of the seed would be destroyed. It was best to put the manure on the surface and let the rains or liberal watering drive it down to the roots in liquid form.

**BLACKWOOD** (Average annual rainfall, 27in. to 29in.).

January 18th.—Present: 18 members and one visitor.

**AGRICULTURAL EDUCATION.**—Mr. J. B. Harris read a paper under the title "Higher Agricultural Education." He was glad of an opportunity, he said, of endeavoring to dispel the idea that farming required no very great amount of intelligence. That idea had no doubt originated in some of the older countries in which agricultural education had been more or less neglected. Agriculture and kindred pursuits were callings in every way as honorable as the practice of law and medicine. The difference in status was probably due to the fact that a professional man was compelled to attain a degree of efficiency before he could charge for his services, whereas there was no fixed standard for the agriculturist. Consequently the fraternity included a minority which was comparatively uneducated. "I do not propose that a standard of efficiency should be compelled by law before a person may engage in agricultural work for profit," he continued; "because the farmer who fails through his own inefficiency usually profits by the experience to some extent without doing any very vital injury to a community. At the same time I may here say that I am in favor of a recognised standard, such as the National Diploma in Horticulture instituted by the Royal Horticultural Society, in collaboration with the Board of Agriculture and University of London, in 1912. This diploma is awarded only after six years' satisfactory practical work, and after passing the elementary, secondary, and final examinations; it corresponds in the horticultural world to the B.Sc. degree in agriculture. To my mind the need for improvement is not so much amongst our best farmers of the present day, though there is always room for improvement in our best—but amongst the more inefficient or negligent. A sound general education in reading, writing, and arithmetic is essential, whilst other subjects, such as bookkeeping, mathematics, and elementary chemistry will be found extremely useful. Such an education is rarely acquired before the age of 14 or 16, according to its extent and the pupil's ability. Supposing the prospective farmer to have a general education, such as I have just outlined, we are now faced with the problem of his more specific education as a farmer. On this point there is probably wider divergence of opinion than upon any other, for many people believe solely in what they term 'practical experience,' whereas I believe in scientific study of the principles involved, and such study usually necessitates a 'college' training, for though our best farmers could teach on these lines, they have not the time to devote to teaching a number of students. This training by practical experience is what I should term a rule of thumb method, or a method without understanding. What I advocate is a more scientific training leading to an understanding of what might be called natural phenomena. As an example to illustrate my meaning—Some years ago farmers in the county of Sussex,

England, who had been in the habit of manuring heavily with stable manure condemned the practice as it did not give favorable results. Then when they chanced upon the use of lime they continued to apply that until in the next generation the ground became 'lime sick'. This next generation of farmers then condemned lime, and still relying upon their predecessors' condemnation of organic manures, and failing to find a new manurial substance, they left the district, and it remained for a time 'lime sick' and uncultivated. It is only since the application of scientific methods to agriculture that it has become known that lime alone as a manurial substance is of little value, but in conjunction with organic matter it makes a most valuable combination; and now these lime-sick rejected arcas are again in cultivation. Thus the addition of lime made available the organic matter in what had been made into a sound soil, but as the organic matter was used up the proportion of lime became too great and the soil became lime-sick. A scientific training teaches a man to inquire deeply, and so get a more extensive understanding and greater mastery of the subject. Many instances similar to the above could be quoted as the case of large market gardens in Essex which were condemned on account of club root (*Plasmodiophora brassicae*) until scientific investigation produced a cure for the disease-infested land. And other instances of the value of scientific training to the producer is found in the study of manurial values, but time does not permit of my writing of that. A training embodying the principles of scientific investigation and agricultural economy would enable farmers and the kindred gardeners to conduct minor experiments on and with special reference to their own properties and problems. At the same time it would simplify very considerably the relation between the producer and the highly-trained scientific investigator. In conclusion, as I have endeavored to show in the foregoing paragraphs, I am strongly in favor of the establishment of and patronage of agricultural and horticultural colleges in this State."

#### CYGNET RIVER.

February 21st.—Present: 10 members.

THE CARE OF HORSES' SHOULDERS.—"A great many horses' shoulders," said Mr. H. T. Noske, in a paper dealing with the care of horses' shoulders, "were ruined when the animals were being broken in through ill-fitting collars or neglect on the part of the colt breaker. When breaking in a young horse great care should be taken to prevent the skin of the shoulders being broken, for if once broken it was always a weak spot, and apt to become sore again. The colt should have a well-fitting soft collar, and if there were any signs of the shoulders chafing he should be turned out for a few days or a breastplate should be substituted for the collar. That would give the shoulder that was chafed a chance to recover. A breastplate could be very simply and cheaply made with the following materials—Two hooks, a bag, a strip of leather, a buckle, and a couple of copper rivets. Secure two hooks with an eye about 4in. long, and a small hook on the end into which to hook the chains. Double up a bag, and sew on the hooks and rivet on a strip of leather about 2in. wide. Make it long enough to go over the shoulders or neck with a buckle on one side, and the breastplate was complete. When using a breastplate it was advisable to also use a back band, or otherwise the horse would most likely get a sore neck. The same should also apply to the broken-in horse. Do not let the skin on the shoulders become cut or chafed before attending to it. The horses' shoulders should be examined every morning, and if any showed the least sign of being chafed or tender the collar should be put aside and the breastplate used, as it very seldom happened that a collar would so chafe the shoulder that the breastplate could not be used. Some horses were very tender in the skin, and it was almost impossible to work them in a collar. He had found that class of horse generally worked well in a breastplate. Boils on horses' shoulders were in most cases caused by injudicious feeding of corn. Horses that were not used to grain should only have a small quantity each day to start with, and as they became accustomed to the feed the allowance could be increased. Horses that have had a long spell should be given light work for a few days to enable their shoulders to harden or set. If that were done there would be very little trouble with sore shoulders." Members present agreed with the views of the writer of the paper. Mr. Wetherspoon asked if a horse could draw as much with a breastplate as a collar. He was told that they would do equally as much heavy work in the breastplate as the collar.

**HARTLEY** (Average annual rainfall, 15in. to 16in.).

January 23rd.—Present: 11 members and one visitor.

**FACTS FOR THE MAN ON THE LAND TO STUDY.**—Lance-Corporal J. G. Hudd, a member of the Branch, at present serving with the Light Horse, in Palestine, contributed a paper, which was read by the Hon. Secretary (Mr. C. M. Hudd). The writer of the paper contended that the cessation of war would be followed by a good deal more attention being given the cultivation of wheat, and as a result prices were likely to fall. Australia would suffer on account of the handicap of distance. In view of these circumstances he thought the farmers should give up the practice of rushing in big areas of crop, and of necessity doing it in an inferior manner, and concentrate on smaller acreages. Many crop failures, he said, were due to bad tillage, an insufficiency of seed, and inadequate dressings of super. A shilling per bushel above f.a.q. market rates was not too much for good seed, and heavier yields and better samples were likely to be forthcoming. A minimum of 60lbs. of seed and 90lbs. of super. per acre should be the rule. Dressings of lime also could be profitably applied. A lengthy discussion followed the reading of the paper, members generally agreeing with the views expressed by the writer.

**LONGWOOD** (Average annual rainfall, 37in. to 38in.).

January 19th.—Present: 11 members and five visitors.

**INSPECTION OF PLOTS.**—Members visited Mr. Roebuck's residence and inspected the irrigation plots and poultry yards. The Poultry Expert (Mr. D. F. Laurie) also attended the meeting, and gave an address on "Poultry."

**MEADOWS** (Average annual rainfall, 35.52in.).

December 19th.—Present: seven members.

**NATIVE FRUITS.**—Mr. J. Stone contributed a short paper, in the course of which he dealt with the habits of growth of some of the native fruits of South Australia, and referred to the uses to which they could be put. The wild cherry, the fruit of which was edible both in the raw state and cooked, was mentioned, and also the peach, which, when ripe, somewhat resembled the Orleans plum; the native apple, the currants and cranberries, both of which were useful for jam, and the barberry. His paper concluded with the suggestion that with cultivation the size and quality of the fruits named might be improved, and eventually become profitable orchard products.

**MILANG.**

January 12th.—Present: 47 members.

**CARE AND MANAGEMENT OF FARM HORSES.**—The following paper, dealing with this subject was contributed by Mr. Sydney Borrett. "In dealing with this subject one cannot help wondering what care will be given the farm horse in 20 years' time if it goes back as much as it has done in the last 20. It is very rare indeed that you will see a well-groomed team of horses nowadays. Horses should at all times be well fed and not left in the paddock in slack times to get their own living as best they can. They should have a feed of chaff or hay every day from harvest time to the ploughing season, and should be brought in and stabled for a fortnight before ploughing starts, to get them in good heart for their work. That is the time to trim up a team. Trim their tails and feet; it is a misery to see horses with their long tails dangling between their legs, all mud and dirt in the wet weather. I favor tying horses up in stalls in preference to letting them run loose in a yard. By the former method every horse gets a fair deal when fed, and you soon get to know how much each eats, and can regulate the quantity accordingly. When they are loose in a yard you put in so many bags of chaff, and the bosses get more than their share; they might stand and feed all right for a while after they come in, but the bosses soon start to walk round and hunt the timid ones away. It is not a good plan to let horses have free run of water. They will do far better on three drinks a day. They should always have as much water as they want when they come in from work, as they are not so apt to get colic as when they have a big drink after feeding. They should be well groomed every morning. A good brush down does a horse a wonderful lot of good, especially in ploughing time, when it cannot find a dry sand hole in which to roll. See that all collars fit well, and that every horse has its own collar. It is a good plan to rub dry sulphur into the hair of the colt's shoulders when first breaking them, as they very rarely scald

when this is done. See that chains are even lengths, and use backbands. Horses are not meant to pull off the point of their shoulders—nothing will spoil the walk of horses more quickly than working them without backbands; it makes a horse step short. Always put belly bands on leaders in a wagon, but do not use rope. A horse gets half the strength from his weight in the belly band if it is put on him correctly. It is not a good plan to shift your team every time you yoke up as horses work far better when they get used to working in one place. I do not like putting a colt in the middle, as the bit is always moving in its mouth, which makes it very sore. The best place for a colt is on the near side, but always use cross reins so that the colt does not have to turn the team around. When wheat-carting do not rush the team into a heavy pull, but teach the horses to pull steadily. A team should be able to stop anywhere on the track and have a blow. Mostly when a team gets stuck it is the driver's fault for rushing his horses. In conclusion, my advice to horse owners is to treat your horses as they should be treated, and you have the best friend and servant the world can give you." At a meeting held on February 9th a paper under the heading of "Feeding and Care of Dairy Cows" was contributed by Messrs. B. Moar and D. W. H. Giles. The paper commenced by pointing out the necessity for careful attention of the following points:—Breeding, selection, feeding, testing, and management, without which little progress would be made in increasing the milk yield. It was considered a good plan to always handle the cows with all quietness, and to see that they had access to a good, clean supply of fresh drinking water, and that they were provided with shelter in the paddocks. One should endeavor to bring the cows in on February 1st or thereabouts, as at that time one could obtain the best prices for the produce, and the cattle would be able to have good strong green feed later on, be dried off early in December, and then brought in again when the harvest was over. One of the most important factors towards successful dairying was feeding. He considered that if the cattle were fed on good oaten chaff, bran, and grain, they would, as a rule, keep in good stall condition. They were strongly in favor of grazing all the green fodder possible, not only did the cows produce more milk and do better, but the labor of carting and cutting was also done away with. It was a good plan to have two or three paddocks, and allow the cows a few days in each paddock. That would keep the feed sweet and fresh. Cape barley sown with the first rains would make good early green feed. Some people were not in favor of the practice of feeding the cows whilst being milked, but they had found that the cows generally were more contented and gave their milk more freely. By the use of the scales and tester one would soon be able to discover those cows that were not paying for the food they consumed, and the sooner they were culled out of the herd the better. The following remedies would be found useful:—For sore teats, lard and methylated spirits; boracic acid was also a good dry dressing. One and a half packets of Epsom salts given once a fortnight would act as a good tonic.

CLARENDON, October 8th.—Mr. H. W. Andrew (Botanical Assistant and Quarantine Officer of the Department of Agriculture) gave a paper on "Weed Control." At close of same he answered several questions, and identified a number of plants tabled by members.

KANMANTOO, January 26th.—A discussion took place as to the variety of wheat best suited to the district. The majority of members spoke in favor of Federation.

MOUNT BARKER, January 23rd.—The Botanical Assistant and Quarantine Officer for Plants (Mr. H. W. Andrew) delivered an address on "Vitality and Germination of Agricultural Seeds" to a large attendance of members.

## SOUTH-EAST DISTRICT.

### COONAWARRA.

January 29th.—Present: 16 members and two visitors.

ERADICATING SORREL.—Mr. W. H. Lear, who contributed a paper on this subject, said sorrel was a weed that could be successfully eradicated by either liming or cultivation. Best results, however, would be obtained if both methods were combined. If liming the soil were adopted, from 10cwt. to one ton to the acre of



either slaked or unslaked lime should be broadcasted and then harrowed in. If crops were to be grown on land from which the weed had been cleared the seed should be sown from six weeks to two months after the application of the lime. If it were decided to destroy sorrel by cultivation the land should be frequently ploughed and harrowed during the hot summer months in order that the roots of the plant might be exposed to the rays of the sun. A thick crop of some variety of fodder should then be sown to smother any pieces of sorrel that might have been left in the ground.

**CRUSHING GRAPES.**—In a paper dealing with this question Mr. W. L. Redman expressed the opinion that in ordinary times it was not advisable for growers to crush their own grapes, but during the present unsettled times it was a subject well worth consideration. About 140 galls of juice, at 1s. 6d. per gallon, could be extracted from one ton of grapes, that represented £10 10s., less £1 14s. 6d. freight, etc., per ton from Coonawarra to Adelaide, and 10s. for carting, crushing, &c.; total £2 4s. 6d., thus leaving a balance of £8 5s. 6d. As small casks were used for fermenting they were able to work them three times a day. A considerable saving in time was also effected by not having to cart to the cellars and wait until the dray was emptied.

#### KYBYBOLITE (Average annual rainfall, 22in.).

January 24th.—Present: 11 members and one visitor.

**FALLOWING FOR WHEAT-GROWING.**—For the successful production of wheat, said Mr. J. Hammat in a paper dealing with the question, it was necessary that the land should be fallowed. The object of fallowing was to conserve moisture for the germination of the seed to be sown, and also to induce weeds to germinate during spring. Fallowing should be commenced as soon after seeding as possible, and the first ploughing done to a depth of 4in. or 5in. He favored a four or five-furrow plough for fallowing, and care should be taken to see that each furrow was doing its work. The ground should be evenly ploughed, and every furrow cut clean and turned over. The first ploughing should be completed during August or early in September, and the harrows then worked across the ploughing. If possible the land should again be cross harrowed as soon as the weeds started to show up. If possible the second ploughing should be done across the first. Thus the soil would be completely broken up. The second ploughing should be done not more than half the depth of the first. After the fallow has been turned back it should be well harrowed. The harrows were a most necessary implement for the working of fallow, and the ground could not be harrowed too much. The greater part of the time between harvest and seeding could be taken up with advantage in the working of the fallow for the coming year. Care should be taken not to work the fallow when dry. The fallow should again be worked with a skim plough or cultivator just before seeding, but a much better result would be obtained if that was done after the first good rain in the autumn. A good discussion followed the reading of the paper, members being of the opinion that the amount of harrowing advocated by Mr. Hammat was excessive for the needs of that district.

#### LUCINDALE (Average annual rainfall, 23.32in.).

January 20th.—Present: 11 members.

**LUCERNE-GROWING IN THE SOUTH-EAST.**—Mr. H. Langberg, who contributed a paper on this subject, said the ground should first of all be selected. For preference he would choose a fern hill, consisting of about 12 acres, then plough the land to about the same depth as the fern roots were growing, which would be about 12in. He would next bring the roots to the surface with the harrow and burn them. The land should again be ploughed and made perfectly level. The land was then best treated with a mixture of stable manure and super., and about 10lbs. of lucerne seed sown to the acre, and then lightly worked with a brush harrow. About a month later watering should be commenced. Lucerne should be watered after each cutting—that would be about every six or seven weeks. The fodder was cut with a grass mower, and allowed to remain on the ground for 24 hours, when it could be raked into small cocks, and then stacked as loose hay. The hay should be kept quite dry, otherwise it would spoil. He did not think it advisable to run sheep on lucerne, as they killed many young plants. A light dressing of lime mixed with

the seed at the time of sowing would be found beneficial in that it would kill many insect pests. In reply to a question as to whether one watering was sufficient between each cutting, Mr. Langberg replied that it was, provided the lucerne was given a liberal allowance of water. In answering another question the speaker stated that he only used a very light dressing of stable manure, but he also used superphosphate during the spring. In discussing the paper, Mr. L. Cotell said to obtain best results it was important that the ground should be well drained and cultivated. He also advised an analysis of the soil. Mr. Langberg considered that an analysis of the water was of more importance than soil analysis, because some of the wells were very brackish. Lucerne could not be grown on flat country in that district, as the water in winter time would kill it. He had sown six bags of super. last September, and harrowed it in about the beginning of December. Since then the crop had been cut twice, and yielded about one ton to the acre each time. He expected to cut it at least twice again. Mr. P. Bourke had tried scarifying lucerne, but found it pulled too much up by the roots. Mr. Langberg advised using the disk harrows. Mr. Cotell was of the opinion that if the lucerne roots were not able to penetrate any distance down the necessary constituents for a good growth should be supplied by artificial means.

**SOME IMPRESSIONS ON OCCUPYING SCRUB LAND.**—Mr. J. Burke, in a paper under this title, said he had had varied experiences of handling scrub land, viz., as a grazing proposition, for wool-growing, for wattle cultivation, and clearing and cultivating. He had found the Merino the most suitable class of sheep. The Crossbreds held their condition well, but being long and loose in the wool the fleeces collected a good deal of rubbish. He considered it necessary to have grass land to work in conjunction with scrub land to enable one to give the sheep a change of pasture. Sheep taken off good green feed and put in scrub for the first time would, as a rule, take some time to accustom themselves to the new pasture, and for that reason it was wise to wait until the grass was dry in summer time, and then turn them out with older sheep used to the paddock. An important item in connection with scrub grazing was to burn off a patch of scrub each year. It was a good plan to go out during September or October with a torch and burn under fences and around the places one intended to burn later on. Another point to bear in mind was that one should be careful not to over stock; 12 or 15 sheep to the acre should be a fair thing. He strongly advised each farmer to plant a few acres of wattles, care being taken to protect the place from fire, and that the seeds were planted during winter months. Wattle cultivation at the present time was beset by a serious drawback—the scarcity of labor. In many places in that district scores of tons of wattle bark had been left on the trees. In the discussion that followed, Mr. Langberg was of the opinion that wool grown in scrub country was of more even quality, as there was not the variation of feeding grounds as when they were shifted from scrub to grass paddocks, and vice versa. Mr. P. Dow considered that yacca country which would not grow hill gums would not grow a cereal crop. Mr. L. McInnes thought that it was a good suggestion to turn sheep in the scrub when the grass country was dry, and also that the depth of subsoil had a great influence on the crop. Members were generally agreed that the Crossbred sheep were better not put in scrub, as they were too open in the wool, and gathered too much rubbish.

#### NARACORTE (Average annual rainfall, 22.60in.).

January 12th.—Present: 24 members.

**EXPERIMENTAL PLOTS.**—The Chairman (Mr. S. H. Schinckel) gave the following report of the experimental plots, which he had conducted on his farm during the past three years. The results for seasons 1915, 1916, and 1917, were as follows:—

Plot.	Variety.	Yield.			Average Yield for 3 years.
		Season. 1915.	Season. 1916.	Season. 1917.	
1	Marshall's No. 3	Bush. 26.12	Bush. 18.36	Bush. 30.10	Bush. 24.59
2	Federation	25.19	13.40	33.35	24.11
3	Lott's	22.27	15.13	31.5	22.55
4	Budd's	23.49	15.40	28.30	22.40
5	Yandilla King	23.6	15.45	24.5	22.59
6	Bayah	13.37	14.27	26.00	18.1

In each case the plots were sown with 50lbs. of seed and 90lbs. of super. to the acre. For the year 1915 the plots were sown on land which had carried peas and oats the previous year. The plots all made good growth, Bayah looking most promising, but it was badly affected by red rust, which accounted for its low yield. For the year 1916 the plots were sown on lea land, which was ploughed twice, owing to the land being infested with sheep weed. The double ploughing did not, however, eradicate the weed, which no doubt reduced the yields. For the year 1917 the plots were sown on fallow, and all made good growth, and were fed off hard by ewes and lambs in August. Although Marshall's No. 3 came out with the top average it was not the best wheat for the land. Federation had an advantage over Marshall's. In harvesting Federation a start could be made with it an hour earlier, and it was fairly easy to strip. Marshall's No. 3 had an advantage of being better for hay. Federation was one of the worst wheats for hay. Lott's did not do well, but this year it did fairly well, and doubled its yield on fallowed land. The experiments were carried out on good chocolate soil, with good subsoil, and a situation which gave natural drainage. There was a difference in the land, portion being black in addition to the chocolate soil, but the plots were on an equal basis so far as soil was concerned.—The following exhibits of potatoes were tabled by Mr. C. Drake:—Early Rose, Coronation, Peach Bloom (72 potatoes on one stalk), Redskin, Carmen No. 2. They were all fine, clean specimens, planted at the end of September of last year, and were obtained from seed supplied from the experimental plots at Mount Gambier the previous year. Mr. C. Bray also tabled the following exhibits of potatoes:—Early Manistee, Early Rose, Beauty of Hebron, Up-to-Date, Coronation, Carmen No. 2. They were planted at the end of September from seed supplied from Mount Gambier Experimental plots. They were fine specimens, but some were a little scabby. Mr. J. J. Donoghue reported having put in six varieties, as follows:—Carmen No. 2, Early Manistee, Early Rose, Up-to-Date, and Beauty of Hebron. They all did well except Beauty of Hebron, which was a failure. Mr. W. Loller also tabled the following exhibits:—Maize planted on October 4th, in sandy soil without irrigation with 70lbs. super. to the acre; planted deep, exhibits over 4ft. high. Wheat plants in ear—Cornell's No. 7, about 4ft. high, yielded fairly well; also other varieties. Rye about 4ft. high, planted on October 4th. Oats, Algerian, planted October 4th, between 4ft. and 5ft. high.

---

FRANCES, February 2nd.—Members discussed the question of the prevalence of "Noxious Weeds."

KALANGADOO, February.—The meeting took the form of a discussion as to the grasses best suited for that district. All members present took part.

**WALLAROO.**  
**MOUNT LYELL**  
**SUPER!**

*It pays you best*

**Australia's Largest Manufacturers  
of  
CAST CHILLED PLOW AND  
CULTIVATOR SHARES**

Naturally **CAN** and **DO** put better quality into their shares than any other maker. They take the ground until worn right back to the socket, and are specially chilled to suit all classes of land.

**Worth More**

**Cost Less.**

**J. & R. FORGAN,**  
**CRYSTAL BROOK AND PORT PIRIE.**

## POULTRY BREEDERS.

---

On application (personal or by letter) to the Poultry Expert, Adelaide, Advice on Feeding, Breeding, Housing, and Diseases, &c., will be given.

Arrangements made for Lectures in Country Districts, and Visits of Inspection paid to Poultry Yards and Farms.

**Publications.**—On application Breeders' names will be placed on the Mailing List.

Monthly Notes in *The Journal of Agriculture*; subscription 1s. per annum, posted; 2s. 6d. Inter-State.

---

### GOVERNMENT POULTRY STATION—PARAFIELD.

Inspection is invited of Stock and Methods Adopted.

---

**PUBLIC VISITING DAYS**—1st Wednesday and 4th Saturday in each Month.

---

### EGGS AND POULTRY FOR LOCAL MARKET AND FOR EXPORT.

Instruction as to Age, Weight, and Methods of Fattening Poultry for the English and Local Markets.

**EGGS.**—Further particulars on application.

Please address all correspondence—

**THE POULTRY EXPERT,**

**ADELAIDE.**

TELEPHONES } 6464  
                  } 6465.

# CROWN LANDS.

## LAND OPEN TO APPLICATION.

Till 3 p.m. Tuesday, April 9th, 1918.

### WESTERN DISTRICT.

*For Agreement or Perpetual Lease.*—Sections in the hundreds of Bartlett, Boothby, Brooker, Caldwell, Campoona, Chillundie, Dixon, Goode, Guthrie, Hague, Haslam, Kelly, Lake Wangary, Mann, Mitchell, Moody, Mortlock, Pascoe, Ripon, Roberts, Rudall, Shannon, Travers, Verran, Wallazippie, and Yadarrie.

### CENTRAL DISTRICT.

*For Agreement or Perpetual Lease.*—Sections in the hundreds of Encounter Bay, Ettrick-Livingston, Roby, and Waikerie.

*For Miscellaneous Lease.*—Sections in the hundreds of Anne, Bagot, Clinton, Dublin, Dudley, Julia Creek, Minlacowie, Port Adelaide, Wallaroo, and Warrenben.

### SOUTH-EASTERN DISTRICT.

*For Agreement or Perpetual Lease.*—Sections in the hundreds of Mount Muirhead, Pendleton, and Senior.

*For Miscellaneous Lease.*—Sections in the hundred of MacDonnell.

Full particulars are published in the *Government Gazette*, or may be obtained, with plans, on application to the Secretary for Lands, Adelaide.

## APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

## ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of any nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

## OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

## NOTICE TO APPLICANTS FOR LAND.

The Land Board meets daily (when necessary) at the Board's Office, Department of Lands, to deal with applications received the previous day for any lands that may be open in the Official List. Applicants must either attend personally or send a full written statement. Forms can be obtained at Post Offices, or on application to the Secretary for Lands.

HARRY JACKSON,

*Commissioner of Crown Lands and Immigration.*

**AGRICULTURAL COLLEGE, ROSEWORTHY.**

The seed grains submitted for sale this season comprise a number of early, mid-season, and late wheats and barleys, a mid-season variety of oats, and a small quantity of field pease. The cereals have all been selected from pure strains and well graded. The production of selected and graded seed has been continued at the College for over 12 years, and hence most of the strains now being offered possess unbroken pedigrees of considerable length.

**CATALOGUE AND PRICE LIST OF SEED GRAINS  
AVAILABLE FOR 1918 SEEDING.**

Orders will now be booked for any of the undermentioned varieties, and applications will be dealt with as far as possible in the order in which they are received. The prices quoted are "on truck, Roseworthy," and are subject to revision. All orders and inquiries should be addressed to—

**THE PRINCIPAL,**

Agricultural College, Roseworthy.

**GRADED PEDIGREED SEED WHEATS.****EARLY VARIETIES.**

King's White . . . . .	Selection 9	..	5/- per bushel
King's White . . . . .	" 10	..	5/6 " "
King's Red . . . . .	" 10	..	5/6 " "
Caliph . . . . .	" 1	..	5/- " "
College Eclipse . . . . .	" 9	..	5/- " "

**LATE VARIETY.**

Le Huguenot . . . . .	Selection 6	..	5/6 per bushel
-----------------------	-------------	----	----------------

**GRADED AND PEDIGREED SEED BARLEYS.****EARLY VARIETIES.**

Tunis 1 . . . . .	Selection 1	..	4/6 per bushel
Tunis 2 . . . . .	" 1	..	4/6 " "
Tunis 3 . . . . .	" 1	..	4/6 " "

**MID-SEASON VARIETIES.**

Tunis 4 . . . . .	Selection 1	..	4/6 per bushel
Tunis 5 . . . . .	" 1	..	4/6 " "
Roseworthy Oregon . . . . .	" 9	..	4/6 " "
Roseworthy Shorthed . . . . .	" 10	..	4/6 " "

**LATE VARIETY.**

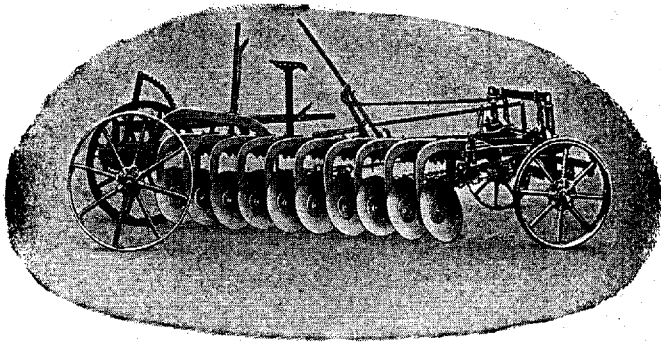
Tunis 6 . . . . .	Selection 1	..	4/6 per bushel
-------------------	-------------	----	----------------

## **SHEARER'S PATENT**

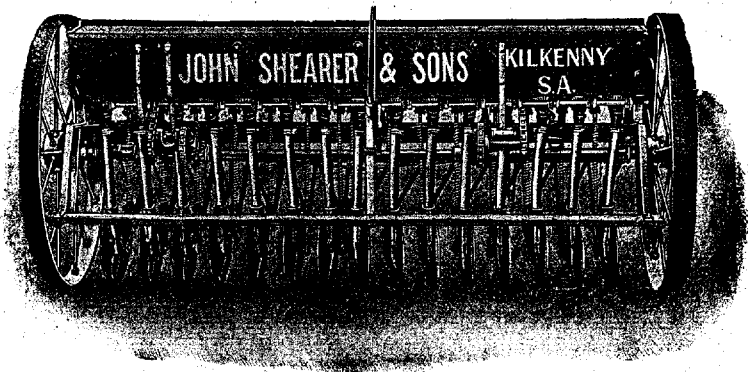
# **STUMP-JUMP IMPLEMENTS**

### **PARRAKIE DISC FIELD TRIAL.**

Eight competing. Result—SHEARER'S FIRST.



**Patented 10 one-way Disc Cultivating Plough, with Bridle Draught**  
Made in sizes from 4 to 12 Discs, with Bridle Draughts.



**Shearer's Patent Seed and Fertilizer Drill.**  
Hundreds of Unsolicited Testimonials.

Write for Catalogue and Price Lists.  
Full Stock of 'Shearer' Steel Plough Shares always on hand.  
Prompt dispatch can be given.

ADDRESS:

**John Shearer & Sons, Kilkenny, S.A.**



## Roseworthy Agricultural College.

WALTER J. COLEBATCH, B.Sc. (Agric.), M.R.O.V.S.,  
Principal.

### SUBJECTS:

Agriculture, Veterinary Science, Dairying, Aviculture.  
Viticulture, Wine-making, and Fruit Culture.  
Chemistry, Mathematics, Botany, English, Book-keeping.  
Surveying and Wool-classing.  
Manual Practice on Farm, Vineyard, Orchard, and in Dairy  
Wine Cellars, and Farm Workshop.

### FEES:

£30 per annum (including board and lodging) and £1 for  
medical fees, payable *pro rata* at the beginning of each  
session.

### SCHOLARSHIPS:

Six, each valued at £90, open for competition annually.

### SESSIONS:

The course of study extends over nine sessions, or three years.

The FIRST SESSION of each year begins on or about the third  
Wednesday in April and closes on or about the third  
Friday in July.

The SECOND SESSION opens on or about the second Tuesday  
after the close of the first session and closes on or about  
the second Friday in October.

The THIRD SESSION opens on or about the second Tuesday after  
the close of the second session, and closes at the comple-  
tion of the vintage.

*Applications for Prospectus and information should be addressed to—*

THE SECRETARY,

AGRICULTURAL COLLEGE,

ROSEWORTHY.

# TOP BRAND



THE  
TRUEST **SUPER** VALUE.

Manufacturers,  
THE ADELAIDE CHEMICAL & FERTILIZER CO., LTD.,  
Currie Street, Adelaide.

---

## OVER 5,000 FARMERS

are members of the

Agricultural Bureau,

**ARE YOU?**

If not, join a Branch at once. If the nearest Branch is not within reasonable distance of your Home, write to the Department of Agriculture for particulars as to how to form a Branch.

**It is to your interest to do so.**

# THE GREAT HOUSE FURNISHING EMPORIUM



## THE AUSTRALASIAN IMPLEMENT and HOUSE FURNISHING CO.

NORTH TERRACE, ADELAIDE.

*R.H. WHITE, Manager.*  
(G.P. HARRIS, SCARFE & CO. LTD. PROPRIETORS)

COMPLETE HOUSE FURNISHERS  
SPECIALISTS IN DECORATIVE EFFECTS.

WE HAVE INSTALLED THE MOST COMPREHENSIVE SYSTEM OF MODERN FURNISHED ROOMS EVER INTRODUCED IN THE COMMONWEALTH. EACH ROOM BEING A STUDY IN CORRECTNESS AND ECONOMICAL FURNISHING. INSPECTION INVITED

KINDLY  
INSPECT  
OUR  
**30**  
MODERN  
FURNISHED  
ROOMS  
SPECIAL

Rich in beautiful well seasoned woods  
and Australian Craftsmanship.

Unique in Original Designs and  
Superior Upholstery Work.

Original Decorative Suggestions in  
Spanish Leather & Tiffany Mottles.

Exclusive Fabrics for Curtains  
Loose Covers and Portieres

Fine Carpets and Rugs from England  
and India, rare designs and colorings

The skill of the Worlds Pottery Artists  
is embodied in our choice selection on view.

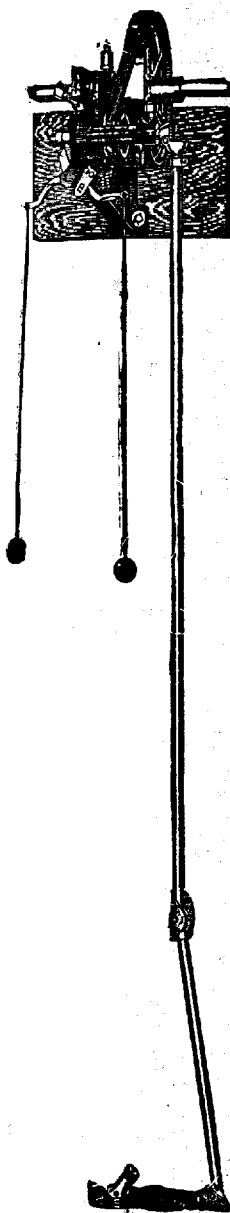
Furnished Rooms for Repatriated  
Soldiers, a study in Sound Value.



A Visitor Stated: "There is nothing in the Eastern States that will compare with these Modern Furnished Rooms."

CONSULT US FOR ALL MODERN FURNISHINGS.

# COOPER SHEEP ! ! ! SHEARING ! MACHINERY.



There is a reason why experienced contractors and shearers prefer the "Cooper." From actual experience they know that where there are flocks to shear the "Cooper" Machines will do the work quickly and cheaply.

The Machines are Guaranteed to be silent, smooth running, and efficient. There is no side thrust. "Cooper" Handpieces, Combs, and Cutters fit other make machines.

Estimates and Particulars Post Free.

## COOPER ENGINES.

Built especially for Farm Work.

Strong, Steady, Reliable.

Easy to operate.

Will stand long years of service.

SIZES  
(Stationary Type).

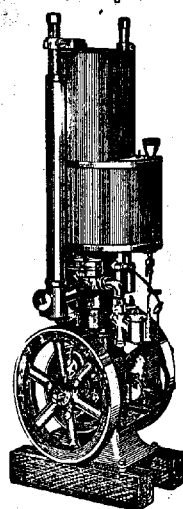
4 H.P.	..	..	Benzine
4 H.P.	..	..	Kerosine
6 H.P.	..	..	Benzine
6 H.P.	..	..	Kerosine

"COOPER"  
LITTLE WONDER ENGINE,  
2 H.P.

Substantially built, easy to start, and ready for duty day and night.

Prices, Catalogue, Easy Terms on application.

"Cooper" Little Wonder  
2 H.P. Engine.



SOLE AGENTS:

The AUSTRALASIAN IMPLEMENT AND  
HOUSE FURNISHING CO. - Adelaide.

(R. H. WHITE, Manager.)

(Geo. P. Harris, Scarfe, & Co., Ltd., Proprietors.)

## AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

"Fruit Tree and Grape Vine Pruning," by Geo. Quinn (Horticultural Instructor); price, 2s. 6d.; posted, 2s. 8d.

"Vinegrowers' Manual," by A. Sutherland; price, 6d.; posted, 7d.

**Journal of the Department of Agriculture**, 1s. per annum in advance; 3d. per single copy to residents of South Australia. Other places, 2s. 6d. per annum.

Any of the following bulletins and leaflets may be obtained by sending a penny stamp for postage:—

Subject.	Bulletin No.	Subject.	Bulletin No.
<b>STOCK AND DAIRYING.—</b>		<b>AGRICULTURE, &amp;c.—</b>	
Bloodworms .....	I.	Agricultural Seeds, Depth of Sowing .....	71
Castration of Colts .....	XXIX.	Dry Farming Conference, 1911, Report .....	XIII.
Cocky Chaff and Straw as Feed for Stock .....	III.	Ensilage, Conservation of Green Fodder as .....	XIV.
Cow, Some Common Troubles of .....	XXXV.	Forage Crops in S.E. ....	92
Dairy Cattle, Suggested Rations for Diseases of Farm Animals .....	IV.	Inman Valley: Address by Director of Agriculture .....	96
Farm Flock, The .....	75	Lucerne Leaf Spot Disease .....	XV.
Farm Horses, Suggested Rations for Farm Livestock: How to Lay Foundation for Good Strains .....	106	Phosphatic Manures .....	87
Farm Livestock: Equivalent of Foodstuff and Feeding Rations .....	V.	Possibility of Improvement in the Farming Practices of Hundreds of Ayers and Hanson .....	95
Horse, The .....	VII.	Roseworthy College Harvest—	
Local Pig Industry, The .....	94	1910 .....	63
Medicine Shelf .....	105	1911-12 .....	69
Roseworthy Agricultural College Flock in 1907-8 .....	85	1912-13 .....	78
Sheep Tick and Sheep Louse .....	41	1913-14 .....	83
Spaying of Cows .....	84	1914-15 .....	90
	IV.	1915-16 .....	104
		1916-17 .....	114
<b>POULTRY.—</b>		Roseworthy Agricultural College Permanent Experimental Field—	
Chickens, Ducklings, &c.: Feeding and Rearing .....	IX.	1905-14 .....	89
Great Importance of Drinking Water for Laying Hens .....	113	1909-10-11 .....	65
Incubation .....	X.	1904-15 .....	112
Poultry Tick .....	74	Wheaten Hay—Investigations into handling, digestibility .....	82
Storing and Packing Eggs .....	XXVII.	Rotation of Crops .....	100
		Salts Injurious to Vegetation .....	103
<b>HORTICULTURE, &amp;c.—</b>		Seeds Imported from Abroad into South Australia .....	109
Codlin Moth, The .....	67	Wheat Diseases and their Treatment .....	110
Currant Industry .....	68	Wheat Yields Past and Future, with a reference to the principal factors that govern them .....	108
Evaporation of Apples .....	101	Wheaten Hay, Stage to Cut .....	73
Flowering Periods of Stone Fruits .....	88		
Fruit Drying: For Beginners .....	31	<b>MISCELLANEOUS—</b>	
Fruit Flies .....	24	Amount of Spirit that may be Extracted from a Ton of Raisins .....	50
"Maggot Fly Pest" .....	25	Beekeeping Notes—Foul Brood, &c. ....	XIII.
Orange in South Australia, The .....	107		
Peach Curl Leaf Fungus .....	64		
Select List of Fruit Trees .....	91		

**THE AGRICULTURAL BUREAU.**—Particulars of this Organisation, of which every farmer should be a member, can be had on application to the Department.

